

# COAL AGE

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## Four Instead of Two

BY FLOYD W. PARSONS



N the days before the war, the business men of America were noted for their initiative. Individuality was the common virtue of most of our citizens. After we entered the fight, it was soon apparent that to be most effective as a people we must act as an organized unit, giving strict obedience to the Nation's leaders.

The result was that we formed the habit of looking toward Washington for all guidance; and the trouble is that we continue to seek marching orders in the Nation's capital. If we are to again go forward as of old, something must be done to restore in part the spirit of personal adventure. The individual must again be encouraged to think and act for himself.

To believe that we will return to the prewar days of selfish indifference is a false conclusion. There will never again be such independence of action. But extreme parental control is a condition no better than extreme individualism.

One of the chief troubles today is that so many people believe humanity can be governed by the application of doctrines that are logical. But this is a false premise. Germany's ruin was caused by her endeavor to base her future on a course of procedure founded on logic. Teuton leaders have learned too late that there is a difference between machines and men. Common sense is far better than logic in the treatment of problems that deal with the impulses and passions of human beings.

It is this same common sense that will save us in these serious days, when the chief impulse of man is to critically examine all human institutions. In Russia the mistake was made of rejecting the traditions that had survived the fires of scores of centuries.

Property, religion and marriage—oldest of institutions—were set aside, and we know now better than ever before that such traditions cannot be broken down without at the same time leveling all other institutions on which civilization is founded.

This does not mean, however, that present systems are wholly correct. We must have greater elimination of caste. Even here, in this free country, where there are no kings and princes to annoy us, we might add still more encouragement to the plan of awarding recognition to men in proportion to the services they render. In the coming years the definite tendency must be to further and further restrict the advantages that come to individuals simply because they are smart, not because they are able.

No future government can succeed unless it is based upon a system in which brains are pre-eminent over capital. More and more will we standardize the return from invested money. More and more will we regulate the margin above interest that is allowed as insurance to those who undertake ventures that are attended by risk. Once capital was the prime party to industry; now there are three others—labor, management and the public, or rather the state. The day is not far away when we will abandon the idea that capital and labor are the only parties concerned.

Just what machinery can be devised to satisfy the combined interests of this quadruple alliance is not now known. Only by careful experiment can we find the answer. Capital must be safeguarded, financial adventures encouraged, labor fully recognized and permitted self-expression, brains adequately rewarded and the public protected. Let us not have patience any longer with talk about fights between capital and labor, as if they were the only parties interested.

## IDEAS AND SUGGESTIONS

### Hot Air for Pumping

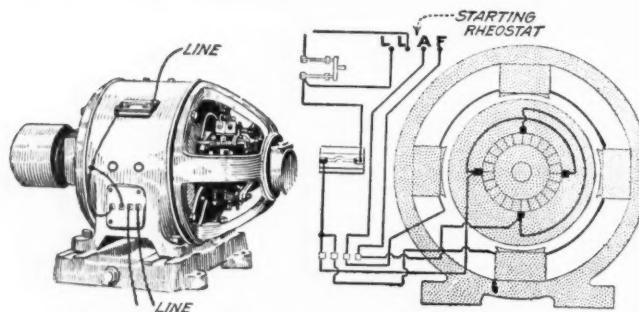
It is correct practice to cool air as it comes from the compressor and so deposit much of the moisture which may be in it. Moreover, the cold air occupies less space and so goes more readily through the air lines. It is going to be cooled on the journey, and the sooner it is cooled the better. For this reason, it is customary to cool it at the receiver even when the purpose is to reheat it before use.

When, however, the air is only to be taken a short distance, say, a few hundred feet, it is well to put non-conducting material around the pipe, taking the air off the discharge line before it is cooled. At its high discharge temperature it is quite dry and can be used economically in the pump or other air cylinder. This will sometimes save a reheater where the pump is in a place where the cold normally causes freezing. If the air is taken to a receiver and so allowed to cool, it is of course no use to spend money to protect the line except, perhaps, the expense for burying the pipe.

### Protecting Small Motors

BY J. J. NOLAN  
Linton, Ind.

The difficulty encountered in protecting small motors in remote parts of coal mines with some suitable and yet not too expensive or elaborate device to prevent burnouts of armature or fields, or sometimes both, has



FIGS. 1 AND 2. WIRING ARRANGEMENT OF COMMUTATING-POLE MOTORS

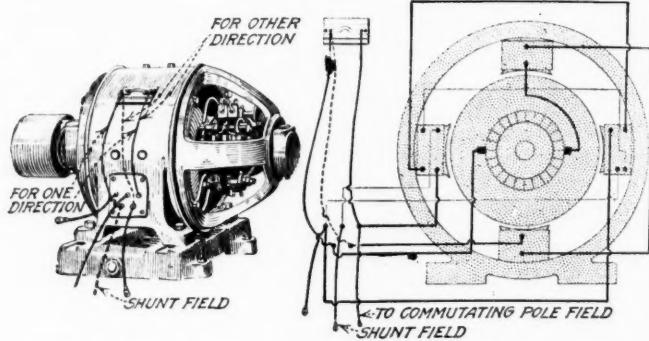
led the company with which I am connected to equip 200 motors, ranging from 5 to 15 hp., with fuse blocks of a type similar to those pictured in Figs. 1 to 5.

When being overhauled in the repair shop each motor is equipped with a block, as shown, and ten extra fuses are fastened securely on the motor for future replacements. A reserve supply of each size is kept on hand, to be sent out as ordered.

Fuse blocks have been installed on most of the motors remaining at the mines by getting a list of different sizes and sending or taking out the number and sizes required. The work then requires only the drilling and tapping of four holes; the block is fastened on and connected as shown.

I have noticed a decrease in the number of serious burnouts since this plan has been in effect. Those in charge of motors in the mine often pay too little attention to this important equipment by trusting in Providence and a little oil once in a while. The company, of course, foots the bill, and occurrences like those mentioned above usually excite no comment.

The wiring arrangement on the commutating pole types of motors shown in Figs. 1 and 2, if properly



FIGS. 3 AND 4. WIRING ARRANGEMENT FOR SHUNT TYPE OF MOTOR

connected, causes the current to pass through the fuse. The reversing connections are easily made (see the dotted lines) should it be desired to reverse the direction of rotation. The wiring arrangement for the simple shunt types shown in Figs. 3 and 4 are somewhat different, as the terminal of the fuse block is reversed for the line wire. Reversing is done below, as shown.

Should the oiling of a motor be neglected, and hot bearings develop that might cause it to stop, the fuse should protect it from serious damage as well as other troubles that might cause heavy overload.

The length, width and thickness of ribbon to use were

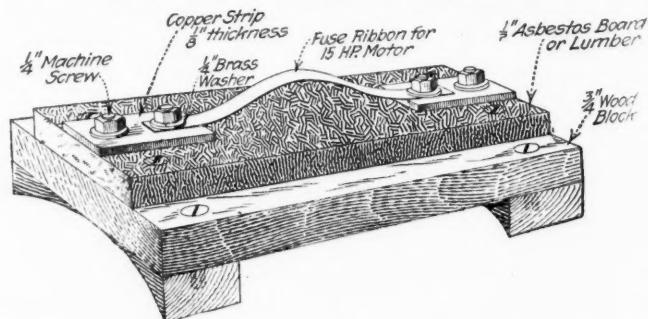


FIG. 5. FUSE BLOCK THAT PREVENTS BURNOUTS

all decided after thorough tests were made for each size of motor. The ribbons employed allow the motor to start under load without blowing the fuse and yet offer protection on any undue continued overload. The connecting and reversing arrangement of connections shown was worked out with a view to its being of assistance to anyone who might be connecting or have

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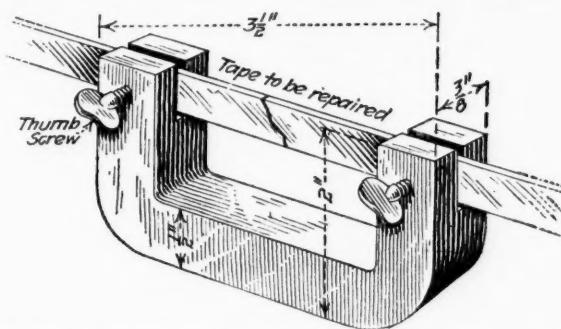
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occasion to reverse one of these motors instead of making the wiring more complicated.

The suggestions given above, however, will not prevent some from attaching a piece of copper wire in place of the fuse ribbon, and those in charge should make periodical visits to each motor to see that the proper sized fuses are in use and that extras are kept on hand. If the sizes of fuses given will not carry the load the motor is either developing trouble, is already in trouble, or is too small for the load required. In this event a larger sized motor should be used.

### Frame for Repair of Steel Tapes

Breaks in steel tapes are unfortunate but inevitable, and it is important that a surveyor be able to repair them accurately. The accompanying illustration shows a contrivance which may be used to hold the two ends of a broken tape while a sleeve is being soldered on the break. The device is rectangular in shape, and is made of  $\frac{3}{8}$  x  $\frac{1}{2}$ -in. iron. Longitudinally across each



DEVICE HOLDS ENDS OF TAPE WHILE SLEEVE IS BEING SOLDERED ON

end a hacksaw cut is made  $\frac{1}{2}$  in. deep, and near each end a  $\frac{3}{16}$ -in. hole is drilled one-half way through the frame, and tapped to receive a thumbscrew. The two ends of the broken tape are passed through the saw cuts in the ends of the frame, the ends being brought exactly together, and then the thumbscrews are set down tight. The surveyor can then proceed to clamp and solder a sleeve over the broken parts. The frame illustrated was made by E. B. Mills, surveyor for the Mason Valley Mines Co., Mason, Nevada.—*Engineering and Mining Journal*.

### How a Western Coal Company Solved Its Labor Problem

BY GEORGE C. MCFARLANE  
Denver, Colo.

The coal industry is now passing through a depression that will strain the resources of many operating concerns. Of course, everyone felt that the erratic wartime prosperity would end some time, but scarcely anyone expected a slump in the middle of the present season.

Practically every mine in the country is in first-class shape physically, as all operators prepared for a tremendous rush of business which, however, did not materialize. Now, in the transition period between war and peace, is a good time to make a concerted effort to stabilize our industry.

The war has shown that public sentiment is the real ruling power, not only in this but in all countries. There is nothing to be gained by disguising the fact that the

coal industry is in distinct public disfavor in the United States. The legislatures of the different coal states are continually passing harassing laws, and they are upheld by the public. In all wage controversies the demands of the coal miners are backed by the press of the nation. The coal industry as a whole must win the confidence of the public, and the operators must establish friendlier relations with their own employees, as other great industries are endeavoring to do. While some coal miners appear to be misanthropes, the majority of our mine workers possess great natural intelligence. As a rule, they dislike to be patronized, and much of the elaborate welfare work instituted by large coal operators is unappreciated. What the miner wants most is a chance to earn big money, and he will cross the continent to make a little larger wage.

Much of the bickering over wages which has periodically disturbed the public mind is caused by the semi-idleness of a large percentage of our coal miners. Coal mining is subject to seasonal and other factors that produce wide fluctuations in the volume of business throughout the year, and I believe it should be the aim of the operators and mine workers to gradually reduce the number of men who follow coal mining as a permanent vocation and increase the number of farmers, farm laborers, etc., who follow it as a seasonal occupation. If the surplus mine workers could be diverted to other lines of work, coal miners could be given practically continuous employment.

During the war period, with its insistent threat of a labor shortage, my company's mines were operated on the following basis, and despite the fact that our force was cut 40 per cent., we maintained our normal daily output:

We decided it would be better to concentrate our working force in five or six panels of a mine, and therefore we sealed off unused and worked-out parts of the mine with concrete stoppings. Our coal readily absorbs oxygen, and after an air current passes through a mile or two of workings miners cannot load as much coal on the return as on the intake. The timber in the return airways and in the upcast shafts decays rapidly, owing to fungus growths which thrive in air deficient in oxygen. Shortening the air travel caused such a marked improvement in the return air that in a few weeks the fungus which was destroying our timber nearly disappeared.

During the slack summer period, we kept our day hands busy grading the haulage roads and putting the track and switches in first-class shape. The roads used by the gathering mules were surfaced with burnt rock and made as smooth as a macadamized road. When the winter rush of business came, we put those diggers who could never get enough cars on runs where the grades were favorable, together with crack drivers and the fastest mules. On runs where the grade was adverse to the loads, slower mules were used and the places were given to diggers who did not care to hit up a fast pace. So far as possible, diggers of nearly equal ability were placed on a run. Normally they were given cars as fast as they could load them, and an average of 12 tons per man was easily maintained.

For years we followed the policy of encouraging the farmers of the neighborhood to take up coal mining as their winter occupation, and with the addition of these men to our force we were able to produce our quota by increasing the output of each miner instead of putting on an army of "floating diggers."

# Recovery of Pyrite from Washery Refuse\*

BY E. A. HOLBROOK  
Urbana, Ill.

**SYNOPSIS**—The utilization of coal washery refuse is frequently a perplexing problem. This waste product, however, often contains pyrite in commercially recoverable quantities. An efficiency of recovery of about 70 per cent. can often be realized by the installation and operation of comparatively simple and inexpensive crushing, screening, jiggling and sometimes tabling apparatus.

**C**AN coal washery refuse be utilized commercially? This question has occurred to every official connected with any coal company operating a washery. The great refuse heaps accumulating near every plant are not only a source of increasing expense because of their ever increasing size, but the fact that they are frequently on fire makes them disagreeable and sometimes dangerous.

Washery refuse is a mixture of pieces of shale, bony coal, and generally iron pyrites or "sulphur." Often

pyrite only analyzes from 46 to 48 per cent. sulphur, the purity of this material obtained from the best washery refuse pyrite is apparent.

It is true that much of the washery pyrite is dull grey or black in color and often has a stony amorphous structure, while the ordinary pyrite is bright, brassy yellow and shows an attractive crystalline formation. Nevertheless much of the washery product is high grade in sulphur, and the dull color often comes from a minute percentage of impurity, such as carbon, acting as a coloring material.

During the war, as a shortage of pyrite was threatened, the Bureau of Mines in coöperation with different state organizations conducted a survey of the different coal fields to learn their pyrite-producing possibilities. This work included a survey of coal mines and material dumped as refuse from many washeries. The utilization of the pyrite on a large scale from the coal mines may not be a commercial venture under peace-time conditions, but the pyrite in washery refuse is in many cases probably profitable of recovery even in normal markets. The following factors must be considered:

1. How much pyrite is there in the washery refuse? Roughly this is arrived at by determining the sulphur content of the refuse material and multiplying by 2. For example, a refuse analyzing 12 per cent. sulphur would have about 25 per cent. pyrite present. At many washeries the refuse examined contained so little pyrite as to be worthless; for example, one refuse analyzed only

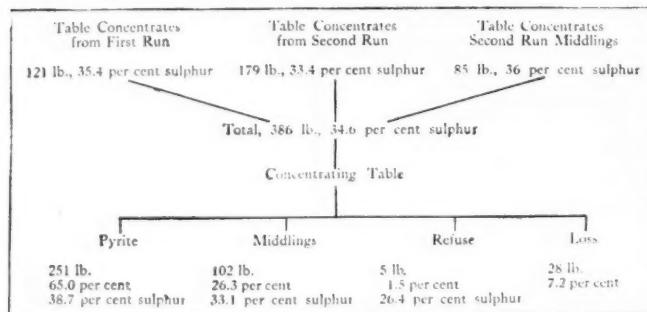


FIG. 1. FLOW SHEET—RERUN OF TABLE CONCENTRATES

some good coal is present. It is the iron pyrite content that offers commercial possibilities through its removal from the refuse, after which the remainder of the dump material can be discharged again in a size and shape that makes its handling easier and its storage safer. The market for iron pyrite is represented by the sulphuric acid plants, situated mostly east of the Mississippi River. The pyrite is the raw material which is burned or roasted for the production of sulphur dioxide, which in turn is converted into sulphuric acid. Pyrite thus becomes a necessary material for the manufacture of explosives and other so-called essentials in war times, as well as fertilizers.

It is impossible to tell by the eye or even by handling how much pyrite is contained in any washery refuse. In general, pyrite when prepared as a separate product for the market should contain a minimum of 40 per cent. sulphur. When absolutely pure pyrite contains about 53.4 per cent. sulphur and 46.6 per cent. of iron. The pyrite lumps found in washery refuse, when cleaned of adhering coal or shale, analyze as high as 48 per cent. sulphur. When it is considered that imported Spanish

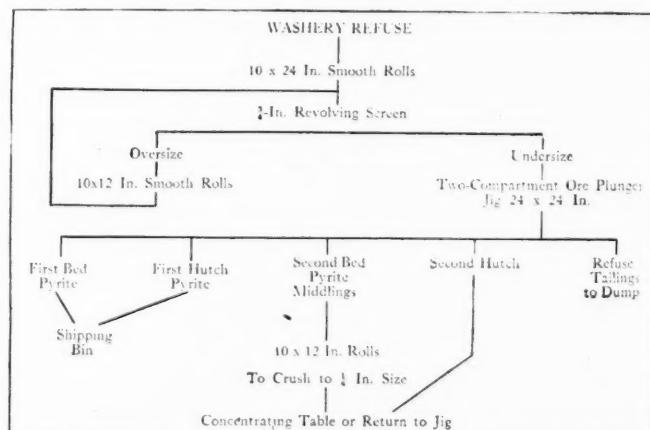


FIG. 2. FLOW SHEET—WASHERY PYRITE RECOVERY PLANT

4 per cent. sulphur or 8 per cent. pyrite. On the other hand, one refuse examined contained 25 per cent. sulphur or 50 per cent. of pyrite. These were the extreme cases. As the pyrite is about three times as heavy as the rest of the refuse, a small mass of it makes an astonishingly large proportion by weight.

2. In what condition is the pyrite? A small amount of the sulphur in the refuse may be combined organically and not be in the pyrite form. In some cases the pyrite is present mostly as small, bright, shiny scales, looking almost like colored fish scales. This form of pyrite is light in weight and generally of low sulphur

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content, in spite of its glistening appearance. Unless the refuse contains a large proportion of the pyrite in a lumpy, stony, hard form of a size equal to the rest of the refuse, its recovery probably is not inviting commercially.

3. What is the purity of the pyrite itself? Attention has been called to the varying purity of different samples. Chemical analysis for sulphur is the only reliable indication. In some cases the apparently pure pyrite was found to contain so much carbonate of lime or iron as to be below commercial grade, even as a cleaned product.

If the foregoing three factors are favorable in a washery refuse, attention should be given to its possible commercial recovery because such recovery involves only the addition to the existing washery of a crushing plant and a suitable jig. It also means easier disposal of the crushed refuse after the pyrite is extracted, as this fine material may be pumped or sluiced easily to the dump.

laboratory on washery refuse from Pennsylvania, and brings out the peculiarities of the pyrite in washery refuse and indicates that a simple plant would make a satisfactory saving. The plant already in operation makes a slightly higher grade of pyrite than was indicated by similar preliminary tests.

#### REPORT ON TESTS OF WASHERY REFUSE

Early in September, 1918, at the laboratory of the U. S. Bureau of Mines at the University of Illinois, about a ton of washery refuse was received from the Cascade Coal and Coke Co., Tyler, Penn. As this material contained pyrite, or "sulphur," it was desired to learn if this pyrite could be mechanically extracted from the refuse on a commercial basis. Tests of crushing, jiggling and tabling the material were made as follows:

The material consisted of a mixture of pieces of pyrite, shale and bony coal of all sizes up to about 2 in. in greatest dimension. Many of the larger pieces

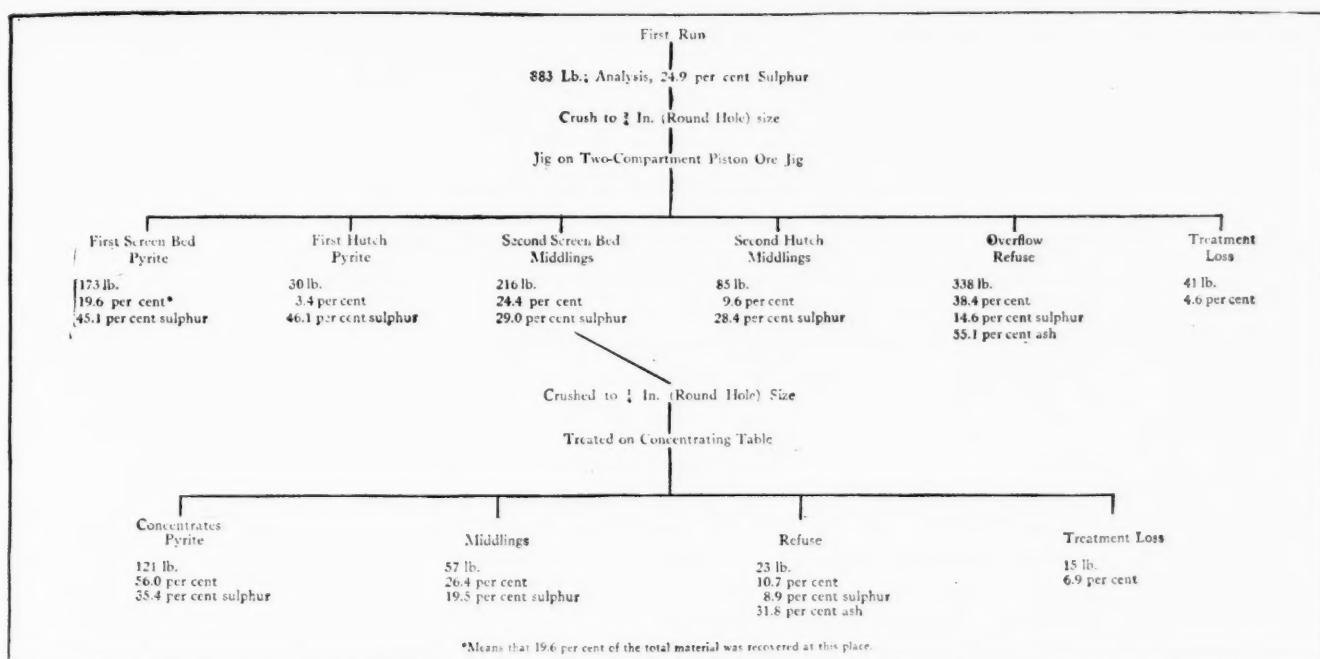


FIG. 3. FLOW SHEET OF FINAL TEST RUN OF WASHERY REFUSE

Furthermore, this reduces the danger of fires in the refuse pile.

The value of the recovered pyrite varies according to its purity and to market conditions, but an index is that the quoted price of Spanish pyrite at the Atlantic seaboard before the war was about \$5 per ton. It should be remembered that pyrite treatment at a washery involves no cost for raw materials and only an operating expense and an interest charge for the plant. Moreover, it provides a use for a present worthless product.

Within the past year at least one large coal washery in the United States has installed a pyrite-saving plant, and this is reported to be running successfully. The preliminary tests on this plant and on material from several other washeries have been carried out by the Bureau of Mines in the coal-washing laboratory of the Mining Department of the University of Illinois, Urbana, Ill. No specific rules can be laid down to govern every plant, but individual experiments are necessary in every case in order to secure satisfactory results. The following report details the tests made at the

washery on washery refuse from Pennsylvania, and brings out the peculiarities of the pyrite in washery refuse and indicates that a simple plant would make a satisfactory saving. The plant already in operation makes a slightly higher grade of pyrite than was indicated by similar preliminary tests.

In crushing, the pyrite showed but slight tendency to crumble and break into fine sizes. This is important because it simplifies the treatment. If, on crushing, the valuable mineral tends to crumble, it makes necessary an expensive treatment of fine material. In this test the pyrite seems stony and the fine sizes contain less pyrite than the coarse.

In testing material of this character it is possible by fine crushing and complicated treatment to recover nearly all the pyrite. Commercially, on account of the moderate value of the product, it is better to simplify the treatment, at the expense of losing a little pyrite. Consequently after the preliminary tests, plans were

outlined for two final tests on the material as follows:

The first provided that after crushing to  $\frac{1}{4}$ -in. size the whole material should be treated on a two-compartment jig with the hope of recovering the coarse pyrite on the jig beds, and of saving the fine pyrite as hutch products in the bottom of the machine.

The second contemplated that after crushing the material to  $\frac{1}{4}$  in. it be rescreened on a  $\frac{1}{4}$ -in. screen, and the material between  $\frac{1}{4}$ - and  $\frac{1}{4}$ -in. size be treated on a jig and the material under  $\frac{1}{4}$  in. in size on a concentrating table. After crushing to  $\frac{1}{4}$  in. the material was treated on a jig according to the first plan mentioned.

The accompanying flow sheet (Fig. 1), called the "Flow Sheet of First Test Run," outlines the work done and the results. The material jigged weighed 883 lb.

#### RESUME SHEET—FIRST RUN—WASHERY REFUSE FROM CASCADE COAL AND COKE CO., TYLER, PENN.

Product	Weight, Lb.	Original weight, 883 lb.; analysis, 24.9 per cent. sulphur		Pyrite		Middlings	Tailings	
		Sulphur, Analysis, Per Cent.	Weight, Lb.	Sulphur, Analysis, Per Cent.	Weight, Lb.		Analysis, Per Cent.	Loss
First bed pyrite	173	45.1						
First hutch pyrite	30	46.1						
Second bed middlings			85	28.4				
Second hutch middlings					338	14.6 sulphur		
Jig refuse						55.1 ash		
Table pyrite	121	35.4						
Table middlings		57	19.5					
Table refuse				23		8.9 sulphur		
						31.8 ash		
Jig loss							41	
Table loss							15	
Totals	324	41.6	142	24.9	361	14.2 sulphur	56	
Percentages	36.6		16.1		40.9	53.6 ash	6.4	
From 883 lb. of washery refuse, 324 lb. of pyrite were recovered or 36.6 per cent. by weight. This analyzed an average of 41.6 per cent. sulphur.								
The middlings product of 142 lb., or 16.1 per cent., analyzed 24.9 per cent. sulphur. If commercially profitable, this middlings could be treated for the recovery of part of its contained pyrite.								
The refuse tailings, 40.9 per cent. of the material by weight, contained 14.2 per cent. sulphur and 53.6 per cent. ash.								
Expressed in another way, from 219.9 lb. of sulphur in the original refuse there was recovered 134.8 lb., or 61.3 per cent.								

and contained 24.9 per cent. of sulphur, or roughly 49 per cent. of pyrite by weight. Clean, coarse pyrite was recovered from the first screen bed, and clean fine pyrite was recovered from the first hutch. The second screen bed gave a middlings product, or one composed of pieces still containing a mixture of shale and pyrite, which must be crushed finer before unlocking the pyrite. The flow sheet shows these middlings were recrushed to  $\frac{1}{4}$ -in. size and treated on a concentrating table with fair results. The overflow refuse was a shale low in pyrite and a bony shale.

The résumé sheet of the first run lists all the products obtained and shows the recovery of pyrite to be 36.6 per cent. by weight of all the material treated. Expressed as sulphur, 61.3 per cent. of all the sulphur was recovered as pyrite by two simple operations—jigging, followed by tabling the recrushed middlings. In a small plant the table could be eliminated and the recrushed middlings fed back to the jig.

The fine pyrite recovered from the table is of lower grade than the coarse pyrite recovered on the jig, the respective amounts of sulphur being 35.4 per cent. and 45.1 per cent. This was contrary to the results obtained on most pyrite which has been tested in the laboratory. The reasons for this will be discussed later. However, since 40 per cent. sulphur in pyrite may be taken as the minimum desirable percentage, if the lower grade

pyrite from the table is mixed with the high grade pyrite from the jigs, the mixture has a grade of 41.6 per cent. sulphur, which is satisfactory.

In the second test, after crushing to  $\frac{1}{4}$  in. the material was passed over a  $\frac{1}{4}$ -in. screen and the  $\frac{1}{4}$ - to  $\frac{1}{4}$ -in. size was treated on a jig, while the size smaller than  $\frac{1}{4}$  in. was treated directly on a concentrating table, according to the second plan previously mentioned. The flow sheet of this second test is shown herewith (see Fig. 3) as is also the résumé sheet.

#### COMPARISON OF THE TWO TESTS

The two tests just described were run under the same conditions. The first was the more simple method and gave the purest pyrite. However, the second method gave a recovery of 72.4 per cent. of the total sulphur as against 61.3 per cent. by the first method.

In both tests the pyrite recovered on the concentrating table contained less than 40 per cent. of sulphur. This was probably caused by the fact that there is a small amount of carbonate of iron in the fine material, and this stays with the pyrite and cannot be removed by concentration.

To test whether or not these fine table concentrates could be improved by further treatment, all the table concentrates from all the runs were united and again

#### RESUME SHEET—SECOND RUN—WASHERY REFUSE FROM CASCADE COAL AND COKE CO., TYLER, PENN.

Product	Weight, Lb.	Original weight, 878 lb.; analysis, 24.9 per cent. sulphur		Pyrite		Middlings	Refuse	Tailings
		Sulphur, Analysis, Per Cent.	Weight, Lb.	Sulphur, Analysis, Per Cent.	Weight, Lb.			
First jig bed pyrite	144	40.7						
First jig hutch pyrite	20	43.9						
Second jig bed middlings								
Second jig hutch middlings								
Jig refuse								
Table pyrite	179	33.4						
Table middlings			129	17.0				
Table refuse					83			
Recrushed middlings	86	36.0						
Recrushed middlings middling				34	20.9			
Recrushed middlings refuse						15		
Jig loss							14.3 sulphur	57.9 ash
Table loss							8.5 sulphur	24.7 ash
Recrushed middlings loss								12
Totals	429	36.9	174	17.3	212		12.0 sulphur	63
Percentages	48.9		19.9	24.1				7.1
From 878 lb. of washery refuse, 429 lb. of pyrite were recovered, or 48.9 per cent. by weight. This analyzed an average of 36.9 per cent. sulphur.								
The middlings product of 142 lb., or 16.1 per cent., analyzed 24.9 per cent. sulphur. If commercially profitable, this middlings could be treated for the recovery of part of its contained pyrite.								
The refuse tailings, 24.1 per cent. of the material by weight, contained 12 per cent. of sulphur and 44 per cent. ash.								
Expressed in another way, from 218.6 lb. of sulphur in the original refuse there was recovered 158.3 lb., or 72.4 per cent.								

concentrated. The result is shown in the flow sheet called the "Rerun of the Table Concentrates."

The second run shows that it is not commercially possible to greatly improve the grade of the fine pyrite from this washery.

#### CONCLUSIONS

The washery refuse from Tyler, Penn., is rich in pyrite. Practically and commercially about 70 per cent. of this material can be saved in the form of pyrite of a grade containing at least 40 per cent. of sulphur.

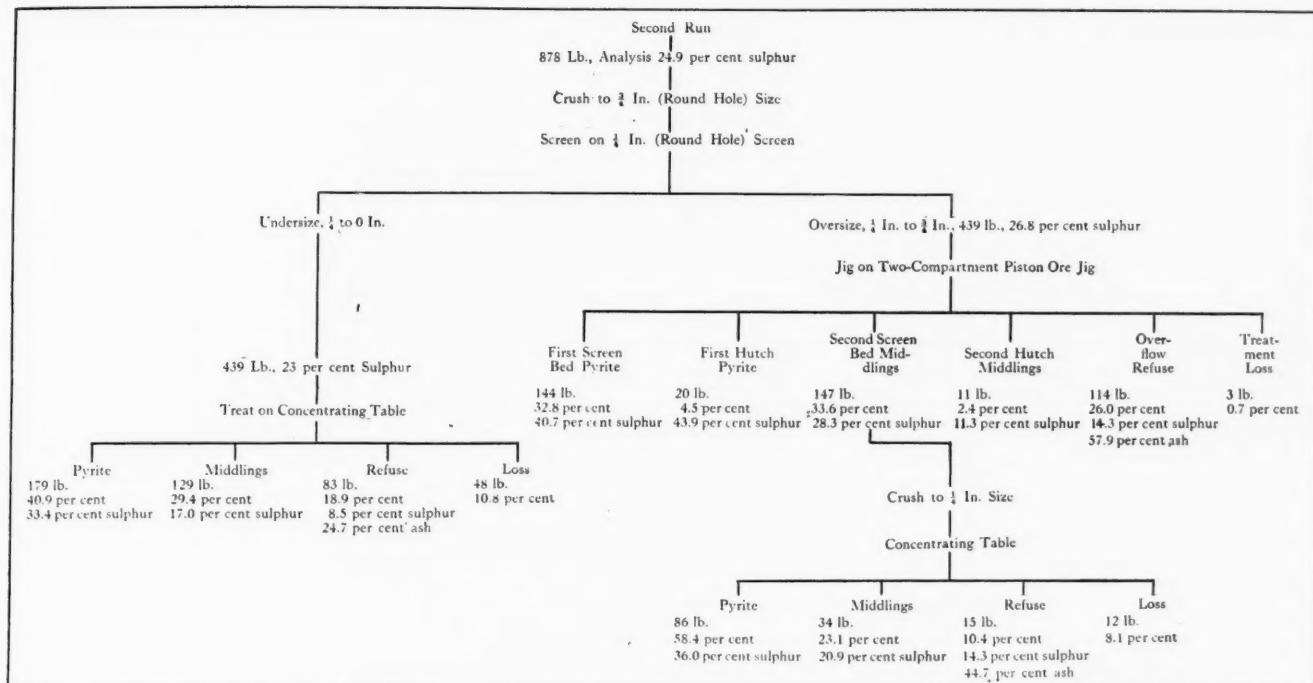


FIG. 4. FLOW SHEET OF SECOND TEST RUN OF WASHERY REFUSE

The refuse from this treatment is a bony shale, of about 13 per cent. sulphur existing in a very finely divided form, and it also contains about 50 per cent. ash. It is worthless as coal. Its high content shows that the coal washing carried out at the Cascade plant is efficient; that is, if the refuse as received at the laboratory at Urbana had contained much good coal, this would have accumulated at the jig overflow and revealed itself in a low ash analysis.

If the Cascade washery furnishes 30 or more tons of refuse per day, a simple pyrite treatment plant should be built to handle the refuse. This should produce, from 30 tons of refuse, at least 12 tons of pyrite containing 40 per cent. of sulphur. A flow sheet of the proposed plant is shown in Fig. 2.

If more capacity is needed, a concentrating table to handle the second bed pyrite middlings after recrushing is recommended. The machinery needed consists of three sets of smooth rolls, one revolving screen, one 2- to 4-compartment ore jig and a shipping bin. Of course water pumps and power are necessary. The cost of machinery and installation should not exceed \$8000 to \$10,000.

### An Episode in the Recent History of the Coal Mines of France

An interesting bit of history is connected with the coal mines about the famous former French city of Lens. At present it is a heap of ruins. The German army of occupation established itself during the first year of the war in a line of trenches squarely across the coal basin of Valenciennes in the neighborhood of Lens, in the north of France. This position was held by the enemy throughout the greater part of the war, and the greatest destruction to the coal mines and surface plants is evident in this section. There were three zones in this coal basin during the war—one along the battle line and the others on either side of this territory. To better understand what followed the German

invasion, it should be realized that about 90 per cent. of all the coal production of France was controlled by the Comité Central des Houillères (Central Coal Operators' Association). The mines of this combination are all connected underground, and poisonous gases tended to circulate through the workings to the west of the battle zone from grenades and shells thrown down shafts by the Germans.

The French worked the mines in the territory west of Lens and it soon became necessary to build concrete dams in the mine entries and other openings both to keep the Germans out and preclude the possibility of their sending gas through onto the French miners. As the water rose in the workings to the east, these dams assumed an increasing importance as it was evident that the enemy aimed to stop French mining operations by every means in its power. The task of building these dams was attended with considerable risk. A Canadian officer was in charge, and he kept his men at work in the face of the many dangers surrounding them. Thus the workings were saved and in recognition of his notable achievement, the Canadian was awarded the war cross of honor. Pierce Williams, of the United States Consular Service, is the authority for this information, and he regrets his inability to state the name of the officer who so distinguished himself. As the Germans made good use of the opportunity to mine coal in the workings to the east of the line of trenches at Lens, it is thought that they also kept the mines in their territory from being flooded by a similar method.

To the east of the battle line the damage to the mines was less and less as the distance increased from Lens, until in Belgium the injury in the mine workings was negligible—there was little accumulation of water in the Belgium mines. However all removable metal and machinery was confiscated and sent to Germany.

The coal plants to the east of Lens in France and extending into Belgium were operated at all times by the Germans practically during the whole war—to the extent of their ability in obtaining men to work in the mines.

## The New Pittsburgh Station of the Bureau of Mines—III

BY GEORGE W. HARRIS  
Editorial Staff, *Coal Age*

**T**HE war greatly disorganized both the personnel and the work of the Bureau of Mines. During the last few years, however, much of value has been accomplished in the laboratories—of value at the time of need and for the future. In that period we progressed in conservation and standardization, and also in elimination of waste. The Bureau of Mines is especially interested in investigations looking to the increase of health, safety and efficiency in the mineral and metallurgical industries. But on the outbreak of war the work of the Bureau was concentrated on those problems whose solution would most increase national efficiency in war. This brought about many changes in the Bureau's organization. Many investigations were temporarily suspended and others were started and vigorously prosecuted.

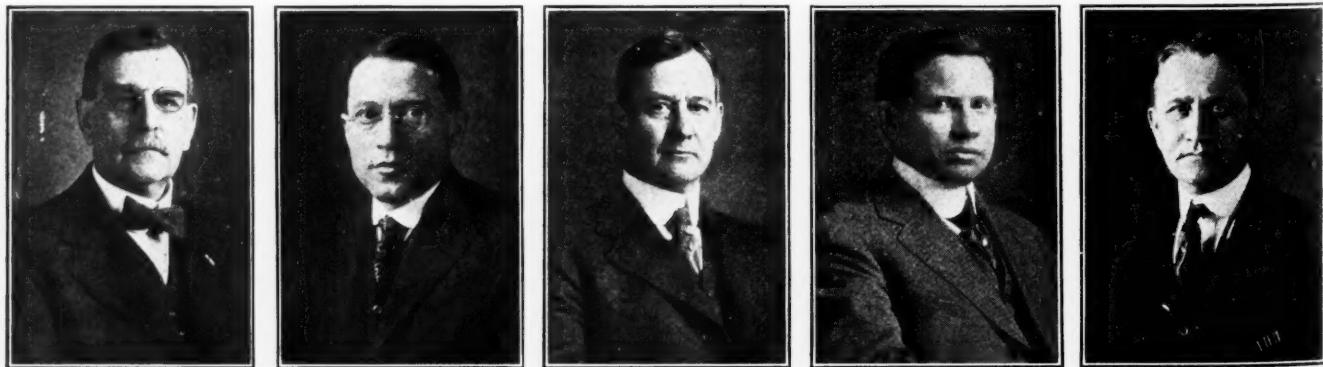
The Pittsburgh station took a leading part in the work of the Bureau. The administrative affairs of this station were placed in the hands of D. A. Lyon, with the title of Supervisor of Stations, and with headquarters at Pittsburgh. He is the supervisor of all the field mining experiment stations.

The Pittsburgh station of the Bureau moved from its old location in the city arsenal into its new building on Forbes Street in October, 1917. At this time O. P. Hood, the chief mechanical engineer of the Bureau, was in charge, but owing to the necessity of his frequent absence from the plant W. R. Talbot was made acting superintendent. This arrangement was continued until Mr. Lyon arrived in Pittsburgh in September, 1918, as supervisor of all stations. At that time Mr. Talbot resumed his former duties as chief clerk, in charge of the personnel of clerical, purchasing, stockroom, filing, library and similar service. The work of moving the station into its new quarters was attended with difficulty and inconvenience, but it was managed so as to interrupt the work of the station as little as possible. The main part of the new building was available early in the fall of 1917, and at that time was occupied by the administrative offices and the various mining sections. Later the new chemical laboratories were oc-

cupied one by one, but the fuels section remained at the arsenal during the winter of 1917-18, as the power plant at the new site was not completed. A number of makeshifts were necessitated. Electric current was obtained from the city lines and steam from the nearby plant of the Carnegie Institute of Technology. H. A. Dent is now mechanical superintendent and has charge of the power plant, machinists, other mechanics and laborers. Special mention was made of the power plant in the first installment of this article, in the Apr. 17, 1919, issue of *Coal Age*.

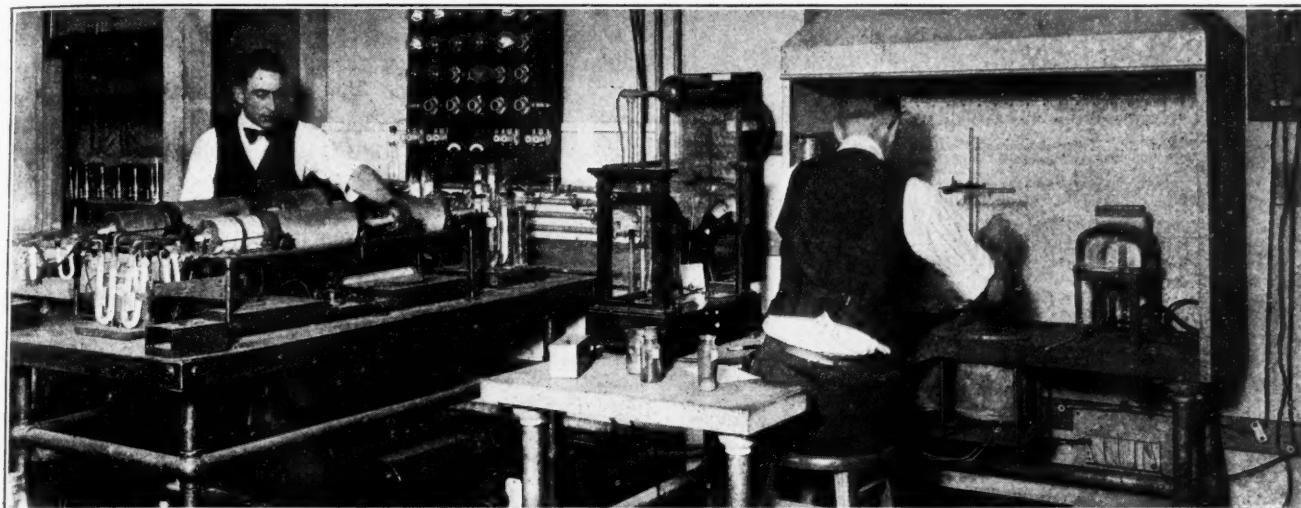
The transference of the station's departments and equipment was conducted under most trying circumstances, and it was extremely inconvenient to carry on the work of the station under such adverse conditions. But the new quarters are a most welcome change from the accommodations of the old arsenal. Here was a chance to correct and improve on old practice and equipment, and full advantage was taken of this opportunity wherever practicable. Considerable time was given to the moving and to the instalment of chemical equipment in the new building. The supervising field chemist of these chemical research laboratories is A. C. Fieldner.

These laboratories occupy practically an entire wing of the station and the work done here is quite diversified. A large amount of routine and investigational work is done by the various divisions. For example, during the last fiscal year over 2000 samples of coal and miscellaneous materials were analyzed, involving 17,477 determinations. Another line of investigation was the determination of the fusing point of coal ash of the coals of a number of states. The results of fusing tests made on the ash of the coals of West Virginia were completed and published, an account of which was reprinted in the Jan. 2, 1919, issue of *Coal Age*, under the title "Fusibility of West Virginia Coal Ash." The results of similar investigations were published in the Apr. 17, 1919, issue of *Coal Age* under the title of "Fusibility of Ash from Coals Found in the Interior Province." The routine analysis and the investigation of mine and natural gases have progressed; also, physical



GROUP OF PITTSBURGH STATION SECTION CHIEFS

Left to Right—W. R. Talbot, chief clerk; A. C. Fieldner, supervising chemist, chemical research laboratories; J. W. Paul, chief coal-mining engineer; D. J. Parker, mine safety engineer; H. A. Dent, mechanical superintendent



ANALYTICAL APPARATUS IN CHEMICAL LABORATORY USED IN ANALYSES OF COAL

Apparatus at the right is used in the determination of volatile matter; the apparatus at the left is used for the determination of carbon and hydrogen

apparatus and measuring instruments have been tested and calibrated. The work of the Bureau requires apparatus not usually found in laboratories.

All research work is apt to appeal to those interested in technical and scientific matters, but space does not permit an account here of the many activities at the Pittsburgh station. However, one such research stands out of peculiar interest to coal men. That is the work being done on the constitution of coal by Dr. Rheinhardt Thiessen, microscopist of the station. A bulletin entitled "Structure in Palæozoic Bituminous Coals," by Dr. R. Thiessen, in press, gives the results of the author's work on the subject during the last ten years. It will be copiously illustrated by photographs of microscopic vertical and horizontal sections of coal. A free translation of the title of this bulletin might be "the origin, composition and general nature of coal"; its woody structure was thoroughly investigated and minutely analyzed. In addition to establishing the theory of the vegetable origin of coal, Dr. Thiessen also presents his evidence as to an index by means of which he correlates the different coal seams.

The chief coal-mining engineer of the Bureau of Mines—J. W. Paul—makes his headquarters at the Pittsburgh station. He has charge of all field investigations and all work at the Experimental Mine, near Bruceton, Penn., pertaining to coal mining. The mine safety engineer of the Bureau—D. J. Parker—also makes his headquarters at the Pittsburgh station. He has charge of mine-rescue operations, the testing of mine-rescue apparatus, the training of miners in first aid and rescue methods, and the conduct of rescue and first-aid contests.

A glance at Table I would leave little doubt as to why the principal field station of the Bureau is located at Pittsburgh. This city is practically the center of a district which includes about 57 per cent. of all the miners in the country. Neither is it strange that the Pittsburgh station is headquarters for those in charge of field investigations and mine rescue operations connected almost entirely with coal mining. The Pittsburgh, or North Appalachian mining, district registers nearly 67 per cent. of the coal miners of the whole country; the next important district—the Eastern Interior—includes only 19 per cent. of the whole number of coal miners in the United States.

The work of the mining section is done chiefly in the field, but it also includes special testing work in laboratories at experimental stations. Engineers are stationed at different coal centers and carry on investigations in mining practice and methods. They also cover safety features. Furthermore, attention is given to the conservation of coal with an idea of obtaining the largest percentage of yield. It is found that in some sections old methods are still used and that the recovery of coal is not what it should be. In such an event a study is made of conditions with an idea of offering

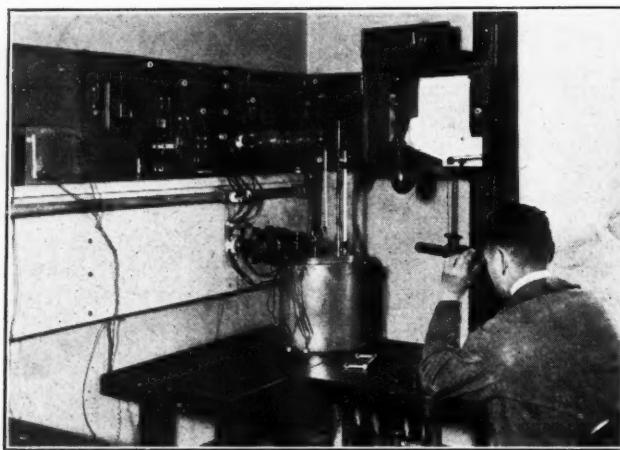
TABLE I. FIELD DISTRICTS OF RESCUE STATIONS AND CARS \*

Mining Districts	Coal Miners †	Metal Miners	Totals
A or North Appalachian.....	483,023	7,589	490,612
B or South Appalachian.....	34,930	10,923	45,853
C or Lake Superior.....		43,051	43,051
D or Eastern Interior.....	135,586	8,526	144,112
E or Southwestern.....	29,885	5,622	35,507
F or Southern Rocky Mountain.....	26,196	14,890	41,086
G or North Rocky Mountain.....	3,990	21,025	27,015
H or Northern Pacific.....	4,903	1,785	6,688
I or Southern Pacific.....	18	30,184	30,202
Totals.....	720,531	143,595	864,126

\* Taken from Eighth Annual Report of Bureau of Mines for year ended June 30, 1918.  
† Data as to miners of year 1914.

suggestions; possibly recommending a modification of practice to try to bring about a larger yield of coal.

Special investigations are undertaken by the Bureau of Mines in the various coal fields of the country. However, it is distinctly understood that such work is not done for an individual but for a general class in a district. Then the particulars about such investigations are published and in this way all operators throughout the country receive the benefit of the Bureau's suggestions. In the case of an investigation of the circumstances attending mine explosions and of conditions in the mine after the accident, samples of coal, road and rib dust and of mine air are taken for analysis and examination. In some instances as much as five tons of coal are obtained. This is reduced to dust to approximate as nearly as possible the same dust conditions as existed in the mine at the time of the explosion. Then a test is made at the experimental mine near Bruceton, Penn., under Mr. Paul's direction. Here it is determined what amount of moisture and inert matter or rock dust are necessary to add to the coal dust to prevent a coal dust explosion; or what conditions



COAL CALORIMETER IN CHEMICAL LABORATORY  
Apparatus is used in testing the heating value of coal

are necessary to limit an explosion. Finally the operator of the mine in question is furnished with a copy of the report of the whole matter, this report giving recommendations which will tend to prevent further explosions in the mine.

Foreign governments carried on certain investigations similar to the work of the United States Bureau of Mines at present, before this Bureau was in the field. England, France, Belgium, Germany and Austria all made investigations. These countries were visited by officials from the United States, in some cases more than once. The testing galleries were above ground and consisted of steel or wood tubes. We have reproduced their steel tubes here and have gone in advance of any of the foreign countries in the development of an actual coal mine in which to conduct experiments. In our experimental work we have had the benefit of the advice of foreign engineers engaged in experimental work. The result is that we have the most advanced coal mine experimental station in the world.

It is the policy of the more progressive coal companies to send their engineers to other fields to investigate mining methods and the handling and preparation of coal. Last year a delegation from one of the prominent Illinois coal fields visited the Pittsburgh station and the experimental mine. Since the return of these coal men, one of the largest of the Illinois companies has spent several thousand dollars in installing certain safety features in its mines. For example, at the experimental mine near Bruceton certain devices are used to control or limit explosions. The Illinois company adopted similar control devices. An account of the Bureau's investigations in regard to explosions can be found in the Aug. 11, 18 and 25, 1917, issues respectively of *Coal Age*, under the title of "Coal Mine Investigations." As a substitute for rock dust with which to combat explosions some of the western mines are using adobe. It has been analyzed and it is known to be well adapted for the purpose.

The action of mine explosions has received considerable attention from the officials of the Pittsburgh station mining section. They have learned just what happens and when it takes place. A sample of mine air has been taken before, at and after an explosion at the Experimental Mine for the purpose of investigation. It is also known if there was any vibration of air backward or forward during the explosion. The direction of the force of an explosion and the location of coked coal dust are matters of considerable interest.

The French engineers claim that the surest indication of the direction of an explosion is indicated by the location of coked coal dust, it always being on points opposite to the direction the explosion takes. For example, in passing props or corners of ribs, eddy currents are formed and coke deposits are found at points where there is a slowing up of the explosion; a strong current blows the coked dust away. The Pittsburgh station is still investigating this French theory. As the experimental mine develops and a greater opening is secured, it is hoped to learn something definite about it. Already from observations made in this country it has been found that where there is an accumulation of coked dust there is evidence of a slowing up of the explosion. This is shown in rooms at the point where the room widens out.

The Pittsburgh mining section has given much attention to mining methods, investigating plans followed, noting the percentage of coal recovered and advising as to better systems. In connection with the Bureau's efforts to secure greater efficiency in mining it should be stated that the various methods are being studied with reference to the effect on the surface. This is notably true in the case of Illinois, where the surface is valuable and numerous suits have been brought against the coal companies for damages. Some of the coal companies here are only getting out 50 per cent. of coal and say that they cannot do better under the present conditions. It is hoped that the investigations will result in real benefit to the operators and the owners of the surface alike.

Another important activity of the mining section is coal sampling. When the Bureau started in, it was found that there was no standard method for sampling coal. Therefore the Bureau was obliged to establish a standard method, and that method has not changed. A sufficiently large sample should be taken to have it representative of the seam. It also requires some judgment in excluding or including impurities. Impurities are not included in the sample when they are rejected in mining or in the preparation of the coal at the tipple. This requires a nice balance of conditions. A sample should show the average quality of coal a mine loads on cars or makes into coke.

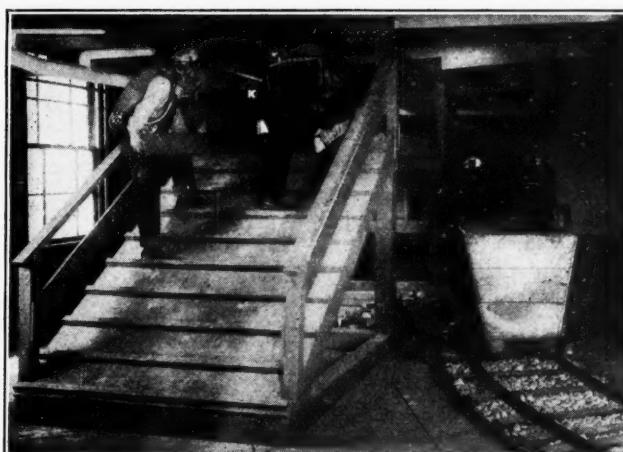
If the coal on cars analyzes high in ash or sulphur, then there would be no use considering that coal for special purposes, unless it was found to be due to impurities which could be reduced in amount by more



DR. R. THIESSEN, MICROSCOPIST, TAKING A PHOTO-MICROGRAPH OF A THIN COAL SECTION

careful mining or preparation. Sometimes the coal itself is high in ash or sulphur. Some think sampling is severe, but it often corrects bad practice of operators or miners. Samples of impurities themselves are taken in the mines for analysis to note the effect on a shipment should they be included in it.

If a miner is alive to the dangers of his occupation and understands how to meet them successfully the battle is half won. This is the attitude of the mine safety section of the Bureau of Mines, under the charge of D. J. Parker, mine safety engineer, with headquarters at the Pittsburgh station. The work of the mine safety section consists primarily in providing for the education of the miner with a view first of preventing mine accidents, second of enabling miners to take care of injuries, and third, attention to sanitation, both in the miner's home and underground. In other words, the work of the section is for the purpose of conserving the life and limb of the miner. In order to conduct the mine safety work to the best advantage, the mining regions of the country are grouped into eight districts. An indication of the territory included in these districts is given in Table I, which also shows the number of miners in each. The districts are planned with special reference to mine safety and rescue work, hence



CREW AT WORK IN TRAINING GALLERY

in such matters. The Bureau reports that during the last fiscal year 36,274 miners visited the rescue cars, stations and trucks; 33,629 attended lectures and safety demonstrations and 8851 were given training. A special service by the Bureau last year was the training of soldiers at military camps in rescue and safety work, and also in the use of breathing apparatus in atmospheres containing poisonous gases.

During the recent influenza epidemic which caused so many fatalities among miners and such serious interruption at times to the operation of coal mines, an unusual opportunity was afforded the car employees to be of service. The crews of several of the cars devoted much time to aiding the hard-pressed people and hospitals; in a number of instances the car supply of oxygen and oxygen inhalators was brought into good use where the use of oxygen was prescribed by the proper authorities. The surgeons detailed for service with the Bureau rescue cars were put on special duty by the United States Public Health Department with a view to abating the epidemic and relieving the sufferers. Their work with the Bureau cars is ordinarily to investigate sanitary conditions at localities visited, give lectures on the hygiene of the home and on mine sanitation and how to prevent the spread of communicable diseases.

*(To be concluded)*



PITTSBURGH STATION TRAINING GALLERY  
Crew at work wearing Gibbs breathing apparatus.

they are grouped around the respective rescue stations and headquarters of the rescue or mine safety cars—the fixed and movable stations. Both classes of stations are scattered throughout the country. The movable stations include eight rescue cars and four auto trucks. Three of the cars are of steel and three more of similar construction are building. There are seven fixed stations.

The field work of those connected with the mine safety section, in the event of mine explosions, is well known. Thirty-eight mine accidents were investigated by the Bureau during the last fiscal year, and of these 30 were in coal mines. This is one of the most important functions of the Bureau and the primary influence in creating the department. Valuable assistance is also given in the inspection of rescue apparatus owned by the mining companies themselves. Advice is given when requested as to the conditions of such apparatus and also to repairs when necessary. It is quite essential that a warning be sounded as to defective apparatus and the need of having all apparatus tested regularly and often by those qualified to judge as to its condition.

In addition to giving aid at mine disasters, the Bureau trains miners in first-aid and mine-rescue work, and organizes field contests in first-aid and mine-rescue work. The success of the Bureau's efforts in this direction is attested to by the interest the miners take

### Comparison of Bituminous and Anthracite Statistics—1918

In the article "Comparison of Bituminous and Anthracite Statistics for Pennsylvania—1918," the output per inside worker in Pennsylvania in 1918 was compared with the output per employee in the United States in 1913. Obviously, the output per employee in the same area should have been taken in each case, the output in the bituminous mines in 1918 being 1009.87 per employee and in the anthracite mines 670.91. As in the bituminous mines of Pennsylvania, each man produced 1009 tons and the anthracite mines 520 tons the bituminous mines did not increase their output per man while the anthracite mines produced 29 per cent. more per head. Neither the bituminous nor the anthracite mines of Pennsylvania had in 1913 a general strike, so the comparison with 1918 would be closely comparable if only the bituminous region of Pennsylvania in 1918 had had an adequate car supply and the culm banks of the anthracite region been worked with equal assiduity in the two years mentioned.

# Inclined Plane of the Union Mining Co.

BY U. U. CARR  
Monongahela, Penn.

**SYNOPSIS**—An inclined plane machine that had been used for several years proved inadequate to handle an increased output. Accordingly an electrically driven hoist was installed. This hoists empties and lowers loads. During the latter operation the motor acts as a generator and returns more power to the line than it consumes in hoisting.

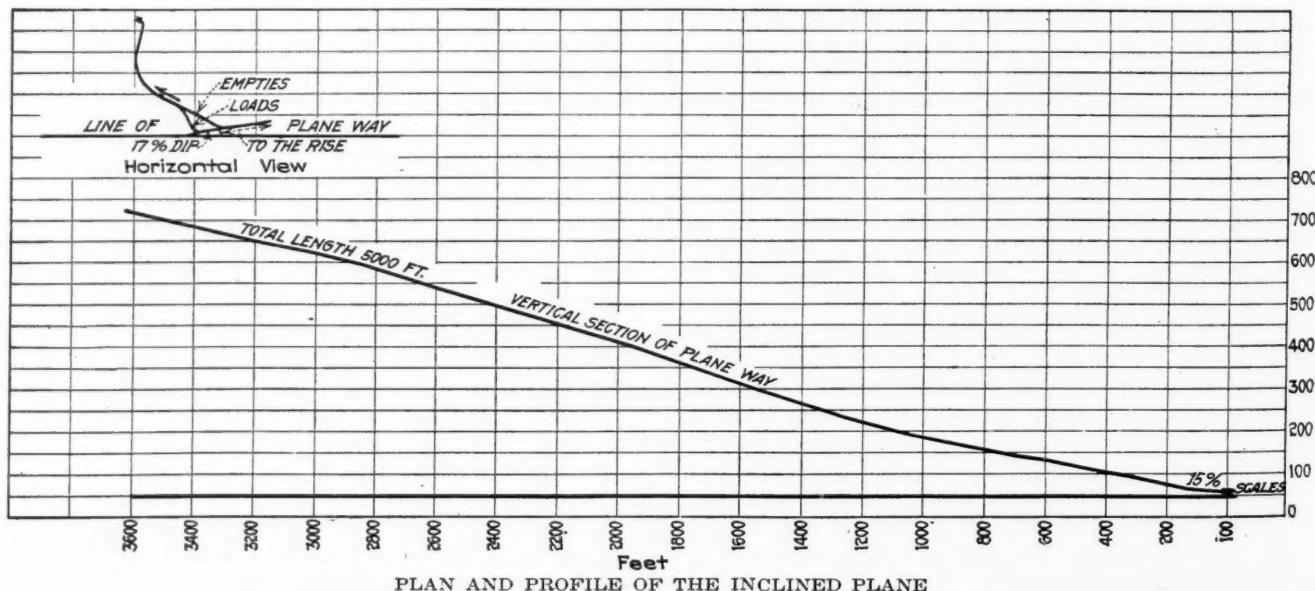
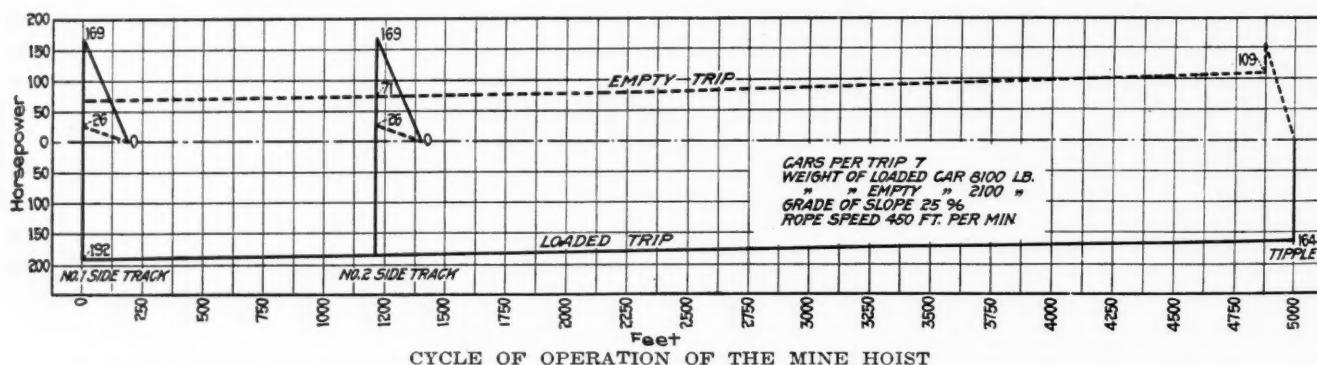
**A**N INTERESTING example in inclined plane operation is afforded by the electrically driven hoist recently installed for the Union Mining Co. at Mt. Savage, Md. This mining operation produces the fireclay used by the Mt. Savage Fire Brick Co. Two beds separated by 300 to 400 ft. of intervening strata are worked. The material is lowered down an incline 5000 ft. long having an average grade of 25 per cent. The usual type of incline machine had been operated for a number of years but proved inadequate to handle the present output. The installation of heavier machinery of a different type was therefore decided upon.

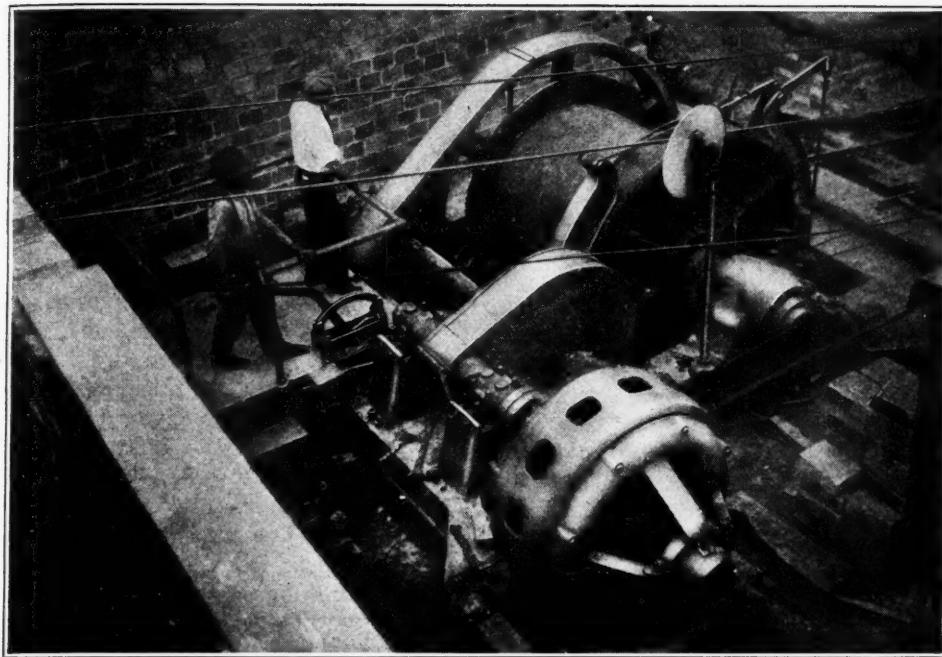
The hoist installed has a single keyed drum 60 in. in diameter with a capacity for coiling 6000 ft. of 1-in. rope. This machine is provided with post brakes and driven by a 200-hp. motor through two gear re-

ductions. In operation trips of seven loaded cars, weighing 8100 lb. each, are placed on sidetracks at the different levels and adjacent to the single track of the incline. These trips are pulled from their respective sidetracks onto the incline, using the motor as a source of power. The motor is then reversed and, acting as a generator, furnishes the braking effect necessary to absorb the energy of the descending loads. The empty trip, also of seven cars, weighing 2100 lb. each, is pulled up the incline by the motor and lowered into the side track by means of the hand brake.

In lowering the loaded trip the regenerative action of the motor insures absolute safety from runaways, and a uniform speed is secured without effort on the part of the hoistman. The hand-operated post brake is of ample capacity to hold the load at any point. As an additional safeguard it is set by a weight and held in the released position by the operator, who is thus always ready to apply the brakes in case of failure of the power supply with a consequent loss of braking effect in the motor. It is to be noted that the hand brake is only used when lowering the empties onto the sidetracks. The disastrous heating and wearing of mechanical brakes incident to their use on long inclines is thus avoided.

The rope speed is 450 ft. per minute, and while no power readings are available the estimated power required to hoist the empty trip varies from 109 hp. at





THE HOIST IN OPERATION BEFORE COMPLETION OF HOIST HOUSE

the bottom of the incline to 70 hp. at the top. In lowering, the loaded trip develops 192 hp. at the top of the incline, diminishing to 164 hp. at the bottom. The power developed is much in excess of that consumed and on a kilowatt-hour basis the power charge would be negative.

The hoist was designed and built especially for this service by the Diamond Machine Co., of Monongahela, Penn. It is driven by a Westinghouse Type C.W., three-phase, 60-cycle, 440-volt motor.

### "Sengite"—A New Mine Explosive With a Guncotton Base

BY M. MEREDITH  
Liverpool, England

The manufacture of a new explosive, known as "sengite," to meet the shortage of nitroglycerine explosives, now used by the mining industry in South Africa, has recently been commenced in that country. The new explosive, which has a guncotton base, is the result of experiments conducted by Kynoch, Ltd., at the Umbo-gintwini (Natal) factory. It consists in the manufacture of tonite, in which nitrate of soda is substituted for nitrate of barium, which is usually used in that explosive. By this substitution it was found that an explosive of approximately similar strength to gelignite could be produced.

The process of manufacture is to incorporate the various ingredients, thoroughly clean, sieve and blend, and finally under hydraulic pressure press them into the shape of a cartridge. The pressure used is from 5 to 10 tons per square inch. In pressing a recess is left in the cartridge to receive the detonator. It is also possible by this process to leave a sufficient amount of water in the cartridges without appreciably reducing their blasting strength, with the advantage that the cartridge is a perfectly safe one to handle. This explosive is so insensitive to shock as to be quite safe if hammered with a steel tool. Accidental explosions in mining caused by drilling into unfired holes would not occur

where this explosive is employed. Sengite, on the other hand, cannot be reliably detonated with an ordinary detonator, such as is used for tonite or gelignite. It will, however, detonate with absolute regularity if it is loaded and fired with a primer cartridge of gelignite or gelatine. The new explosive has been given a rigid test by a number of mines and has been found satisfactory in every way. The special equipment necessary, having a monthly capacity of 5000 cases, is now being built at Johannesburg. The sengite produced up to the present has been made on the original experimental machines. All of this has been of a uniform strength equivalent to ordinary gelignite.

Other derivatives have also been made, and it was found that a series of explosives containing other ingredients can be produced, so that weaker and cheaper forms of explosives can be made to take the place of the series of gelignites and dynamites, down to about the strength of 30 per cent. nitroglycerine explosives. The cost of producing sengite under war conditions was slightly greater than that of gelignite, but peace time prices may change this.

The name of this new explosive originated with the manufacturers, the first four letters being the initial letters of the following words "substitute explosive, no glycerine." The last three letters are taken from the word dynamite.

IT IS QUITE likely when an explosion occurs in a mine that the cage, signaling devices, headframe tower, or derrick may have been wrecked or disabled. Immediate preparations should be made to descend the shaft. To determine whether men are alive at the bottom, signals should be given by pounding on any pipes extending down shafts. Lack of response may be due to the pipes being broken. To make sure, get a  $\frac{1}{4}$ -in. rope, fasten to its end a lighted electric hand or flash lamp, a lighted safety lamp and a small cage containing a canary bird, and lower them to the bottom of each shaft. If men are alive at the bottom they may see the lights and give some signal or attach a message. The lower end of the rope should remain down five minutes, it should then be withdrawn, and the safety lamp and the canary examined. If the safety lamp is still lighted, and the canary alive or not disabled, men may safely descend the shaft, provided no change of ventilation in the meantime would cause the air in the shaft to change from still or intake to an upcase current. The return of the lighted safety lamp and the live canary will indicate that the oxygen content of the air is more than 17 per cent. (pure air contains about 21 per cent.) and that the carbon monoxide content, if any, is less than 0.20 per cent.—*Rescue and Recovery Operations in Mines*.

## Coal Resources of Western Canada—II\*

BY JAMES WHITE

Assistant to Chairman, Deputy Head, Commission of Conservation, Ottawa, Canada

**SYNOPSIS**—*British Columbia, like Alberta, has coal in many stages of mineralization, but so large is Western Canada that the government believes it best to make plans for the carbonizing of the low-grade coals of Saskatchewan, thus saving freight and, incidentally, byproducts. The close of the article speculates on the possibility of such utilization of the Saskatchewan lignites and on the briquetting of near coke and the powdering of coal.*

THE Crowsnest region contains the most important body of coal now being mined in British Columbia. The coal covers an area of 230 square miles, and is a high-grade bituminous, occasionally running into anthracite, averaging about 64 per cent. fixed carbon. Much the greater portion of the coal is converted into coke, the remainder being sold as steam coal. There are 22 workable seams, with a total thickness of 216 ft., 100 ft. of which is estimated as workable.

In addition to the Crowsnest field referred to above, areas of coal-bearing rocks are found at several points in southern British Columbia. The Princeton field includes an area of about 50 square miles. At Princeton there is an 18½-ft. seam of lignite carrying 42 per cent. fixed carbon, 38 per cent. volatile matter and 16 per cent. moisture. At Nicola seams 6 ft., 10 ft., 5 ft. and 12 ft. thick respectively, have been mined. The Nicola coal is a sub-bituminous and analyzes about 47 per cent. fixed carbon, 39 per cent. volatile and 4 per cent. moisture. Coal has also been found at Tula-meen, Kamloops, Hat Creek and North Thompson River. The total area in Vancouver Island underlain by coal seams is about 600 square miles. These coal fields contain some of the best steam coals on the Pacific Coast.

The coal of the Comox field is a coking, bituminous fuel and contains 57.2 per cent. of fixed carbon, the highest carbon content of all the Vancouver Island coals. Three seams have been mined in this field. The Nanaimo field has a productive area of 65 square miles, though the area underlain by coal seams is somewhat larger. The seams vary in thickness. Occasionally a seam containing from 2 to 3 ft. of dirty coal carries 30 ft. of clean coal at a point only 100 ft. distant. Run-of-mine coals from this field run as high as 56 per cent. fixed carbon and 43 per cent. volatile combustible; the commercial samples having a heat equivalent of 12,470 to 13,160 B.t.u.

The coal fields of the Queen Charlotte Islands are of Cretaceous and Tertiary age. The Cretaceous coals range from semi-anthracite to low-carbon bituminous. The Tertiary coals are lignites. In 1871 mines were opened in the semi-anthracite at Cowgitz, but the coal was so badly crushed that the enterprise was abandoned.

This coal analyzed 83 per cent. fixed carbon and 5 per cent. volatile combustible; the fuel ratio being 16.5.

Central British Columbia has lignite beds at Alexandria, Quesnel and Prince George on the Fraser, on the Nazko River, Nechako River, Dean River and Lightning Creek. Three seams of bituminous coal, possibly a coking coal, aggregating 20 ft. in thickness, have been reported on a tributary of Morice River, and three seams on Goat River, a tributary of the Telkwa, aggregate 56 ft. in thickness.

The most important coals thus far discovered in the northern portion of British Columbia are the semi-

TABLE VII. COAL PRODUCTION IN BRITISH COLUMBIA 1898-1917

Year	Tons	Value	Year	Tons	Value
1898.....	1,263,680	\$3,384,858	1908.....	2,333,708	\$7,292,838
1899.....	1,431,101	3,833,307	1909.....	2,606,127	8,144,147
1900.....	1,791,833	4,799,553	1910.....	3,330,745	10,408,580
1901.....	1,919,488	5,141,487	1911.....	2,542,532	7,945,413
1902.....	1,808,441	4,844,040	1912.....	3,208,997	10,028,116
1903.....	1,676,581	4,490,844	1913.....	2,714,420	8,482,562
1904.....	1,862,625	4,989,174	1914.....	2,239,799	6,999,374
1905.....	1,945,452	5,211,030	1915.....	2,063,613	6,455,041
1906.....	2,146,262	5,748,915	1916.....	2,584,061	8,075,190
1907.....	2,364,898	7,390,306	1917.....	2,433,888	8,235,716

anthracites and anthracites of the Groundhog Mountain area. An area of 170 square miles is assumed to be coal-bearing. It contains eight seams, with an aggregate thickness of 30 ft.

The "actual" and "probable" reserves in British Columbia are: Semi-anthracite, 1.9 per cent.; bituminous, 85.4 per cent.; low-carbon bituminous, 3.3 per

TABLE VIII. COAL PRODUCTION OF THE PRAIRIE PROVINCES AND BRITISH COLUMBIA IN THE CALENDAR YEAR 1917

	Tons	Per Cent. of Canada's Production	
		Value	Per Cent. of Canada's Production
Saskatchewan.....	355,445	2.53	\$662,451
Alberta.....	4,736,368	33.72	14,153,685
British Columbia.....	2,433,888	17.33	8,235,716
Total.....	7,525,701	53.58	\$23,051,852

cent.; cannel, 2.4 per cent.; lignitic, 7.0 per cent. Lignites have been discovered on Kispiox River, Sustut River, Peace River and Liard River. Bituminous coal has been found near Peace River cañon, and on the Taku River.

Canada's total consumption of coal in 1916 was 29,-865,856 tons. Of this total, 41.3 per cent. was Canadian

TABLE IX. IMPORTS INTO PRAIRIE PROVINCES, BRITISH COLUMBIA AND PORTION OF ONTARIO TO WEST OF LAKE SUPERIOR IN THE YEAR ENDING MARCH 31, 1917

	Tons	Value
Bituminous lump.....	2,067,416	\$2,850,121
Bituminous slack.....	260,197	337,655
Anthracite.....	521,611	2,924,308
Total.....	2,849,224	\$6,112,084

and 58.7 per cent. was imported coal. In normal times, taking the average during the period, 1894-1913, the consumption is about 48 per cent. Canadian and 52 per cent. imported, the increase in imports at the present time being due largely to the demands for munition and other manufactures in the coal-less portion of

\*From a booklet entitled "Fuels of Western Canada." Continued from page 748 of the issue of Apr. 24.

Canada—Ontario and Quebec—and to the decrease in the production of Nova Scotia.

Locomotives, in 1916, consumed 8,677,354 tons. This constituted 29.1 per cent. of all coal consumed in Canada. It was 34.3 per cent. of the total consumption of bituminous and lignite in the Dominion and was 38.2 per cent. of the total consumption of bituminous.

The Vancouver Island and Nicola Valley collieries, in 1917, exported 32.6 per cent. of their output to the United States, exported 2.4 per cent. to other countries and sold 65 per cent. for consumption in Canada. The corresponding figures for 1912 are 21.2 per cent., 7.5 per cent. and 71.3 per cent. respectively. In 1902, 75 per cent. was exported to the United States. These figures show a remarkable change of market.

prevail, and anthracite is almost unobtainable west of Lake Superior. It has been predicted that when the war is over and conditions approximate to normal, hard coal will be marketed at a lower price. An examination of prices during the last 20 or 25 years, however, and the well-established fact that at the present rate of consumption the anthracite of the United States would be exhausted in less than a century, indicate that the theory of lower prices after the war is utterly fallacious. Even prior to the war, the production was decreasing at the rate of approximately 1 per cent. per annum. The question, therefore, is: What can be done in the way of producing a fuel that approximates to anthracite or toward the production and utilization of lignite under more advantageous conditions?

The briquetting of carbonized lignite promises to furnish an artificial anthracite. So far as the writer knows, however, no plant has yet produced it on a commercial scale, though, on the recommendation of the Research Council the Dominion Government has appropriated \$200,000 for that purpose, this sum to be supplemented by votes of \$100,000 each by Manitoba and Saskatchewan. In 1917, B. F. Haanel, of the Mines Branch, Department of Mines, investigated the process of manufacture and practicability, costs, etc., of the manufacture of carbonized lignite briquets. Presumably based on Mr. Haanel's report, the Research Council estimated that a plant with a capacity of 30,000 tons could produce the briquets for \$7.25 per ton, assuming that the lignite, half slack and half run-of-mine required to produce one ton of briquets, could be purchased for \$1.12 $\frac{1}{2}$ . As the production of slack in 1917, at the principal mines



BRITISH COLUMBIA, SHOWING PRINCIPAL COAL-PRODUCING CENTERS

The production in the Crowsnest district in 1917 was 617,956 short tons. Of this production, 252,949 tons, or 40.9 per cent., was exported to the United States; 82,441 tons, or 13.3 per cent., was sold in Canada; 282,566 tons, or 45.7 per cent., was converted into coke or was used for colliery purposes.

In 1917, the Crowsnest Pass Coal Co. produced 504,762 short tons, the Canadian Collieries, 690,111 tons, and the Western Fuel Co., 714,533 tons, contributed, in the aggregate, 78.4 per cent. of the production of British Columbia.

In 1917, the Vancouver Island collieries produced 1,648,201 tons, or 67.7 per cent. of the output of the province; the Nicola-Princeton collieries, 167,731 tons, or 6.9 per cent.; Crowsnest (East Kootenay) district, 617,956 tons, or 25.4 per cent.

At present, owing to the war, abnormal conditions

in the Estevan district, was only about 55,000 tons, it is obvious that all lignite required over and above this amount would be run-of-mine, which, on the basis of costs in 1917, increases the cost of the briquets 75c. per ton, or to \$8 in all.

In 1917, the Commission of Conservation instructed its mining engineer, W. J. Dick, to make an investigation of markets, freight rates and cost and tonnage of lignite in the Estevan district. Mr. Dick reported that, based on the figure for operating expenses supplied by the Research Council, and allowing the manufacturer a profit of \$1 per ton, the briquets could be marketed at a lower price than anthracite in western Manitoba and Saskatchewan, the price ranging from 45c. per ton less than anthracite in Portage la Prairie to about \$2 per ton less in Moose Jaw. If run-of-mine coal is used, it will of course decrease this profit by 75c.,

but will leave an ample margin in the Regina and Moose Jaw markets.

In manufacturing carbonized lignite briquets, the raw material is heated in closed retorts to drive off the moisture and nearly all the volatile matter. The carbonized material is left behind as a coke which contains about double the amount of fixed carbon contained in the raw lignite. This carbonized material is mixed with a binder and compressed in a briquetting machine. Subsequently the briquets are waterproofed by heating, and so coking, the binder. Two tons of raw

in 1917 it was 406,856 tons; in 1916 the plant at Bankhead, Alta., produced 82,249 tons of briquets.

Pulverized coal was utilized first in cement plants and was found to be an excellent low-priced fuel of high efficiency. Later, it was applied in certain metallurgical processes and, during the last four years, several United States railways have successfully operated locomotives with this class of fuel.

In copper smelting, notable results have been achieved; furnaces, with a rated smelting capacity of 500 tons of ore per day, are now smelting twice that

TABLE X. ANALYSES OF BRITISH COLUMBIA COALS

Locality	Moisture Condition*	Loss in Air-Drying	Moisture	Volatile Combustible	Fixed Carbon	Ash	B.t.u. per Lb., Gross	Fuel Ratio	Carbon Hydrogen Ratio	Coking Properties	Authority†
Crow's Nest Pass:											
Corbin, No. 4 mine.....	A.D.	0.4	0.5	24.6	61.1	13.8	2,500	2.50	17.9	Poor coke	Mines Br., B. 26
Michel colliery.....	A.D.	1.2	0.7	22.4	65.0	11.9	13,260	2.90	16.9	.....	Mines Br., B. 26
Coal Creek colliery.....	A.D.	0.9	1.3	26.0	63.8	8.9	13,640	2.45	17.3	.....	Mines Br., B. 26
Flathead Area:											
Butt's 31-ft. seam.....	R.	...	4.7	24.1	59.2	12.0	.....	2.45	.....	Non-coking	Mines Br., B. 26
Okanagan Lake, B.C. seam.....	R.	...	1.6	33.9	55.4	9.1	.....	3.89	.....	.....	Geol. Surv., M. 53
Tulameen, Granite Creek.....	D.	...	33.7	54.0	12.3	.....	1.60	14.9	.....	.....	Mines Br., B. 26
Nicola, Middleboro collieries.....	A.D.	0.5	3.9	37.6	44.5	14.0	11,230	1.20	12.3	.....	Mines Br., B. 26
Chilliwack River, 5 miles up.....	.....	.....	.....	35.7	63.9	0.4	.....	.....	.....	.....	Geol. Surv., M. 53
Vancouver, English bay.....	A.D.	4.6	14.5	34.3	44.3	6.9	.....	1.30	.....	Non-coking	Mines Br., B. 26
Nanaimo Area:											
No. 1 mine, Douglas seam.....	A.D.	0.6	1.6	40.6	47.7	10.1	12,620	1.20	14.4	.....	Mines Br., B. 26
Newcastle seam.....	A.D.	0.5	1.9	40.7	45.7	11.7	12,230	1.10	14.3	.....	Mines Br., B. 26
Wellington seam.....	A.D.	0.7	1.1	39.7	49.2	10.0	13,020	1.25	15.0	.....	Mines Br., B. 26
Comox Area:											
No. 4 mine, lower seam.....	D.	...	31.6	56.5	11.9	12,870	1.80	16.5	.....	Minex Br., B. 26	
Comox lump coal.....	R.	...	32.2	56.3	10.4	13,210	1.75	15.3	.....	Minex Br., B. 26	
Trent River seam.....	.....	0.9	32.9	58.3	7.8	.....	.....	.....	.....	Geol. Surv., M. 53	
Browns River seam.....	.....	0.9	23.8	70.9	4.3	.....	.....	.....	.....	Geol. Surv., M. 53	
Beaufort mine.....	.....	29.3	55.7	14.9	.....	.....	.....	.....	.....	Geol. Surv., M. 53	
Baynes Sd. mine, Richardson seam.....	1.2	34.1	48.5	16.2	.....	.....	.....	.....	.....	Geol. Surv., M. 53	
Baynes Sd. mine, upper seam.....	.....	29.1	57.5	13.4	.....	.....	.....	.....	.....	Geol. Surv., M. 53	
Baynes Sd. mine, lower seam.....	.....	29.5	64.7	5.8	.....	.....	.....	.....	.....	Geol. Surv., M. 53	
Squash, Pacific Coast mine.....	D.	34.3	42.7	23.0	11,100	1.25	.....	.....	.....	.....	Geol. Surv., M. 53
1 m. south of Kilkiswi River seam.....	3.7	42.2	39.8	14.3	.....	.....	.....	.....	.....	Geol. Surv., M. 53	
Kink River, near Beaver Har. seam.....	3.7	39.3	47.0	10.0	.....	.....	.....	.....	.....	Geol. Surv., M. 53	
Koskimo coalfield.....	1.0	34.4	54.0	10.6	.....	.....	.....	.....	.....	Geol. Surv., M. 53	
Queen Charlotte Islands:											
Yakout River, Masset inlet.....	R.	2.7	38.2	53.7	5.4	.....	1.35	14.0	.....	Firm, coherent coke	Geol. Surv., M. 53
Camp Wilson.....	R.	2.0	35.7	48.3	14.0	.....	.....	.....	.....	Non-coking	Mines Br., B. 26
British Pacific Coal Co.....	R.	5.3	5.3	65.2	24.2	.....	12.0	31.7	.....	.....	Mines Br., B. 26
Cowgitz.....	R.	2.2	7.9	75.3	14.6	.....	9.55	.....	.....	Non-coking	Mines Br., B. 26
Fraser River, Above Lytton:											
Hat ck. 1 mile above Marble cañon.....	.....	8.6	35.5	46.8	9.1	.....	.....	.....	.....	.....	Geol. Surv., No. 53
North Thompson river, 45 miles up.....	.....	2.2	38.1	46.8	12.9	.....	.....	.....	.....	.....	Geol. Surv., No. 53
Kohasganko river.....	.....	9.9	42.6	34.0	13.5	.....	.....	.....	.....	.....	Geol. Surv., No. 53
Nechako river, Fort Fraser:											
Skeena River:											
Skeena river, 9 miles above forks.....	1.0	19.1	39.0	40.9	.....	.....	.....	.....	.....	.....	Geol. Surv., No. 53
Skeena river, 20 miles above forks.....	1.5	7.2	46.0	45.2	.....	.....	.....	.....	.....	.....	Geol. Surv., No. 53
Watsonkwa River.....	.....	40.5	57.5	2.0	.....	.....	.....	.....	.....	.....	Geol. Surv., No. 53
Morice River, seam No. 1.....	4.3	28.9	54.6	12.2	.....	.....	.....	.....	.....	.....	Geol. Surv., No. 53
Morice River, seam No. 2, top.....	4.5	25.9	55.6	14.0	.....	.....	.....	.....	.....	.....	Geol. Surv., No. 53
Morice River, bottom.....	3.6	28.2	53.9	14.3	.....	.....	.....	.....	.....	.....	Geol. Surv., No. 53
Coal Creek, 5 ft. 6 in. seam.....	1.4	10.9	80.8	6.9	.....	.....	.....	.....	.....	.....	Geol. Surv., No. 53
Toozza River, 16 miles from mouth.....	4.6	33.8	42.7	19.0	.....	.....	.....	.....	.....	.....	Geol. Surv., No. 53
Telkwa River:											
Goat Creek.....	R.	1.3	31.0	59.8	7.9	.....	1.90	.....	.....	Fair coke	Mines Br., B. 26
Goat Creek.....	R.	2.7	4.9	76.4	16.0	.....	15.60	.....	.....	Non-coking	Mines Br., B. 26
Goat Creek Transcontinental seam.....	0.8	8.2	81.6	9.4	.....	.....	.....	.....	.....	.....	Geol. Surv., M. 53
Goat Creek, lower seam.....	1.0	9.9	80.8	8.3	.....	.....	.....	.....	.....	.....	Geol. Surv., M. 53
Hudson Bay Mountain.....	9.2	5.6	74.7	10.5	.....	.....	.....	.....	.....	.....	Geol. Surv., M. 53
Tuchi River, Babine Lake.....	2.5	17.3	52.2	28.0	.....	.....	.....	.....	.....	Non-coking	Geol. Surv., M. 69
Coal Creek, Zymoetz River.....	5.4	34.0	48.2	12.4	.....	.....	.....	.....	.....	Partly fritted	Geol. Surv., M. 69
Shegumia River, Salmon R., No. 3 seam.....	1.2	20.6	57.3	20.9	.....	.....	.....	.....	.....	Coking	Geol. Surv., M. 69
Kispiox.....	1.2	10.3	64.8	23.7	.....	.....	.....	.....	.....	.....	Geol. Surv., M. 69
Groundhog Area:											
Western Development Co.....	1.2	6.5	83.4	8.9	.....	.....	.....	.....	.....	.....	Geol. Surv., M. 69
Trail Creek.....	1.4	7.2	49.0	42.4	.....	.....	.....	.....	.....	.....	Geol. Surv., M. 69
Pelletier seam.....	1.3	7.7	61.9	29.1	.....	.....	.....	.....	.....	.....	Geol. Surv., M. 69
Firepan Creek, Tacka Lake.....	R.	8.7	36.7	44.3	10.3	.....	1.20	.....	.....	Non-coking	Mines Br., B. 26
Peace River, Carbon River.....	R.	1.5	20.5	75.9	2.1	.....	3.70	.....	.....	Barely agglomerates.	Mines Br., B. 26

\*A.D." indicates that the sample analyzed was air-dried; "R" indicates sample as received; "D" indicates that sample was dried at 105 deg. C.

†"Minex Br., B. 26" indicates that the information was obtained from Bulletin No. 26, Mines Branch, Federal Department of Mines. "Geol. Surv., M. 53," and

‡"Geol. Surv., M. 69" indicates that it was extracted from Memoir 53 and Memoir 59 respectively, Geological Survey of Canada.

§Moisture and volatile combustible combined.

lignite produce one ton of briquets. This, of course, practically doubles the amount of fixed carbon and ash.

The question of the material to be used as a binder is an important one. Coal-tar pitch makes an excellent binder, but it is reported that the cost is high; the quantity available in Canada is also somewhat limited. Sulphite pitch, produced in the manufacture of paper pulp, has been successfully used as a binder in experimental work. The production of briquets of all kinds in the United States in 1916 was 295,155 net tons;

amount with pulverized coal. Notable economies have been obtained where it has replaced oil fuel, and a better distribution of heat has been obtained. W. G. Wilcox states that by comminution "we have changed entirely the characteristics of coal as commonly known." In addition to the greatly increased efficiency obtained, pulverized coal is practically smokeless, small coal can be utilized, anthracite culm, bituminous screenings and coke breeze assume a new importance, inferior grades of coal can be mixed with better grades and burned

successfully, and the labor of the fireman is reduced to a minimum.

To obtain the best results, about 85 per cent. should pass a 200-mesh screen and it should contain not more than 1 per cent. of moisture. After being reduced to this high degree of fineness it is blown through a burner nozzle, the volatile gases of the pulverized coal igniting instantly. The fixed carbon is consumed by the heat of the volatiles, the flame resembling an oil or gas flame. By increasing or decreasing the supply of air or fuel, the operator regulates the supplies and has the operation under absolute control.

W. G. Wilcox, in the *Mining and Scientific Press*, June 22, 1918, p. 850, says: "By grinding an inch cube of coal so fine that 85 per cent. will pass a 200-mesh screen, we have increased the surface exposure from 6 sq.in. to approximately 1800 sq.in. Thus, we have increased the velocity of combustion 300-fold. By doing so, we have changed the characteristics of the fuel. We now have a fuel that is 300 times more active than the inch cube of coal, a new type of fuel

ammonium sulphate is also greater than is obtained in the byproduct coking process.

Where a coking coal is obtainable at a reasonable price, the establishment of central coking plants near large centers of population seems to offer the maximum of advantage. Such a plant would produce, a coke or artificial anthracite, gas for cooking or heating, coal tar which contains the elements entering into the manufacture of a whole series of valuable substances, benzol, toluol and other raw materials for explosives, aniline oil whence aniline dyes are manufactured, and ammonia, liquor from which is produced sulphate of ammonia, a valuable fertilizer. The coke thus produced can be used for all purposes for which anthracite is used. It requires a little more care in firing. Furnaces burning coke require a somewhat larger firebox than for hard coal.

W. J. Dick estimates that: "Such a plant established in the city of Toronto to supply 300,000 tons of artificial anthracite per annum would not only provide such fuel cheaper than anthracite, but would supply

TABLE XI. ANALYSES OF NOVA SCOTIA COALS  
(From "Analyses of Canadian Fuels, Part I, The Maritime Provinces," by Edgar Stansfeld and J. H. Nicholls, Bulletin 22,  
Mines Branch, Federal Department of Mines)

District	Moisture Condition	Loss in Air Drying	Volatile Moisture	Volatile Combustible	Fixed Carbon	Ash	B.t.u. per Lb. Gross	Fuel Ratio	Carbon-Hydrogen Ratio	Name of Mine
<i>Sydney Area:</i>										
No. 7 or Hub seam.....	Air-dried	0.9	2.6	35.5	56.1	5.8	13,490	1.60	14.5	Hub colliery.
Harbour seam.....	Air-dried	0.8	1.6	38.0	54.6	5.8	13,780	1.45	14.3	No. 9 coll., Glace Bay.
Phalen seam.....	Air-dried	1.5	1.9	34.3	58.4	5.4	13,770	1.70	14.2	No. 5 or Reserve coll.
N.S.S. & C. Co., main seam.....	Air-dried	0.8	2.7	36.3	54.0	7.0	13,400	1.50	14.1	No. 1 colliery.
Inverness Ry. & Coal Co.....	Air-dried	1.8	7.6	36.9	45.9	9.6	11,230	1.25	11.8	Inverness colliery.
<i>Pictou Area:</i>										
Acadia Coal Co., Foord seam.....	Air-dried	1.9	1.8	32.7	54.4	11.1	13,000	1.65	15.3	Allan shaft.
Acadia Coal Co., Cage Pit seam....	Air-dried	1.7	2.0	30.8	56.9	10.3	12,910	1.85	15.8	Albion colliery.
Intercoll. Mining Co. ....	Air-dried	0.3	1.1	24.4	60.1	14.4	12,830	2.45	16.6	Drummond colliery.
<i>Springhill Area:</i>										
Dominion Coal Co. ....	Air-dried	0.8	2.0	31.6	57.4	9.0	13,100	1.80	14.6	No. 2 colliery.
Dominion Coal Co. ....	Air-dried	0.5	2.3	32.7	53.8	11.2	12,680	1.65	15.0	No. 3 colliery.
Joggins mines.....	Air-dried	0.4	3.2	39.6	44.3	12.9	11,770	1.10	13.0	Chignecto colliery.

\* Though not strictly germane to the subject of "Fuels of Western Canada," the analyses of typical and well-known coals of Nova Scotia and the United States have been added for purposes of comparison.

that has in it inherent possibilities not to be found in lump or slack fuel."

Mr. Wilcox further points out that increasing surface exposure increases the intensity of the heat. The rate of combustion doubles for each rise of 18 deg. F., and thus pulverized fuel burns hundreds of times faster than lump coal.

In the manufacture of carbocoal, a high-volatile coal, after crushing, is distilled at a low temperature, 850 deg. F. to 900 deg. F. This first distillation yields gas and tar and a product, called "semi-carbocoal," which is high in carbon. The first distillation is continuous, the coal being agitated and mixed by a twin set of paddles. Thus all portions of the charge are uniformly distilled.

After mixing the semi-carbocoal with part of the pitch obtained from the tar produced in the first distillation, the mixture is briquetted. The briquets are then subjected to a second distillation at about 1800 deg. F., which yields carbocoal, additional tar and gas and a substantial amount of ammonium sulphate.

Carbocoal is dense, dustless, clean, uniform in size and quality, and stands transportation without disintegration; its density is greater than that of coke and more nearly approaches that of anthracite; the briquets can be made in any size from  $\frac{1}{2}$  oz. to 5 oz., the larger sizes being better suited for locomotives and the smaller being adapted for domestic use; the yield of tar and

1,500,000 M. cubic feet of gas at a cost of 10c. per M. at the plant; again, based on pre-war prices for cost of plant and bituminous coal, the profit on the undertaking would be considerably more than 50 per cent. per annum." Whether such coke plant be municipal or private owned, it offers what is, at the present time, the most promising solution of the fuel question for Saskatchewan, Manitoba, Ontario and Quebec.

The steadily increasing price of anthracite and the decrease in the reserves of this valuable fuel emphasize the warnings the Commission of Conservation has issued from time to time, urging the greater utilization of our water powers, both to decrease the consumption of imported coal and to use in bartering for such fuel in time of need. During the war, Canadians cannot expect to receive their full quota of anthracite, and the consumer should appreciate the necessity of using other coal fuel. The citizen who has, heretofore, burned anthracite regards the prospect of general use of raw bituminous coal with dismay, and will turn with relief to a smokeless fuel, such as coke, provided we can supply him with an article that has most, if not all, the characteristics of anthracite.

The initial difficulty in the preparation of such a fuel lies in the fact that Nature, with the agencies of pressure and time duration far beyond anything that man can hope to approximate to, has produced the dense, stony fuel which we call anthracite, whereas our

imitation—coke—has a cellular structure developed by escaping gas during distillation, a structure analogous to that produced in bread-making.

Hitherto, it has been assumed that coal should be coked practically at the pit mouth. The general acceptance of this idea is largely due to the fact that the coke was manufactured for metallurgical purposes, and the amount used by many smelters would not justify the erection of coke ovens at the smelter nor, in many instances, would it be possible to utilize all the gas produced in connection with the coking. On the other hand, a plant established near a large city has not only a market for the coke, or artificial anthracite, but also for all the gas produced.

Summing up the foregoing discussion of the economic utilization of our coals under existing circumstances, I am of the opinion that, speaking generally, coking plants established in the immediate vicinity of large markets offer the most advantageous method of utilizing coal for domestic purposes.

For large individual consumers, locomotives, and certain other uses, pulverized fuel promises to revolutionize present practice. It is almost axiomatic that the less labor and cost expended on the preparation of coal fuel the better; and, other things being equal, the process that approximates most closely to this dictum is the most efficient and most economic.

Owing to the slackening and crushing due to evaporation of the contained moisture, the mining of lignite is carried on in the autumn and winter, though the mines could be more efficiently operated in summer. To permit mining in summer, and to avoid slackening, it has been suggested that the lignite lump be put in pits in the ground and covered with earth, the covering being wetted from time to time if necessary.

Mr. Brereton, City Engineer of Winnipeg, states that good results have been attained by piling the lignite on the surface and covering it with slack. An application has been made for a patent on storing lignite lump in pits with masonry or concrete walls and bottom, but it is questionable whether this is a patentable device.

## The Abuse and Care of Motors

BY RICHARD BOWEN  
West Pittston, Penn.

With the passing of the mule comes a new era in the transportation system of every mine. In many mines where the development has reached to considerable proportions it is no small proposition to replace animal with mechanical power. Thousands of feet of trolley wire have to be strung, miles of rails have to be bonded and fishplated, and the switches and frogs that were in use oftentimes require replacement by heavier material. In order to do this we may have to take down roof, take up bottom, and in many cases do considerable skipping. This all goes on the deadwork list.

The foregoing is only a small part of the expense. There is the installation of the generator, motors, cables and everything that goes with the system if it is to be successful. It is during the installation of this material that great care should be taken by the person having charge of this work.

Particular attention should be given to the manner of hanging the trolley wire, as it has been my experience to find hangers work themselves loose two weeks after

they were put in, resulting in the wire falling to the ground and coming in contact with the rail. Holes for the hangers should never be drilled where the roof is soft. It is far better to place pipe across from rib to rib and clamp the hangers thereto.

The position of the frogs and switches are also important. Of course, the position of the frog on the wire will be governed by the location of the frog in the road; hence it will be seen that all curves connected with the branches should have as long a radius as possible.

Every section of a mine where the haulage is done by electricity should have a circuit breaker of its own, so that if anything goes wrong with the power in one section it will not affect any other part of the mine.

All trolley wire at the foot of the shaft and along traveling roads and crossings should be guarded by strips of board 4 to 6 in. wide running parallel with the wire. The bonding of the road should be inspected every day and any defects remedied immediately. The power lost through defective bonding is sometimes greater than that required to start the trip.

In some mines mules and horses are badly abused; but this is as nothing compared with the abuse some locomotive runners give their machines. The durability and upkeep of a locomotive depend entirely on the care taken by the motorman. Two motors may work under identical conditions but be handled by different men. It will be found that it takes more to keep up one of them than the wages paid the motorman; and it is not unusual to change armatures on one motor two or three times as often as on the other.

The following are some of the causes that cost the company thousands of dollars yearly: (1) The motorman overloads his motor. This results in backing up the trip a dozen times in order to start it, even with a severe jerk. This wastes time and throws an undue stress on different parts of the machine. (2) Throwing the power on too quickly when starting the motor from rest. (3) Bringing the motor to a standstill when in full motion by applying reverse lever and brake. (4) Not shutting off power soon enough when about to couple the motor onto the trip. This results in a severe shock to the motor on coming in contact with the bumper of the leading car. (5) Not keeping sand boxes clean or oiling motor properly. Some motor runners use the same kind of lubricant for different parts of the machine. This should not be done. The fast-moving parts should have light thin oil while the journals and other heavier parts should have heavy oil or grease.

A good motor runner when starting his trip will throw on his power gradually as the load increases; and when he finds the load too heavy, he does not waste any time in jerking the trip but cuts it in two. He will always shut off the power before he applies the brake and never try to stop the machine by throwing the reverse lever unless there is danger of an accident.

He will also use his judgment when he is about to stop his motor for any reason. He does not wait until his trip is at the required spot and then throw his reverse lever and apply the brake in a hurry, but shuts off his power in time so that the trip will be near a standstill by the time it reaches the required point.

The ambitious motorman is always looking over his machine to see that none of the bolts, nuts or anything else has worked loose. If he finds anything of this nature he does not send for the head electrician but takes his wrench and tightens it himself.

# Prices—Yesterday, Today and Tomorrow\*

BY O. P. AUSTIN

Statistician of The National City Bank of New York

**SYNOPSIS**—The author blames the increase in prices to inflation of currency, rather than to labor demands, and shows that it is world-wide and not restricted to belligerents or even to civilized people. It embraces all products at the place of manufacture, and so does not rest on war demands or transportation. Resting on inflation it will fall with deflation, but that deflation the author regards as extremely remote.

**I**N A few instances since the war there have been slight reductions in prices, but in others there are still advances, and the index figures on foodstuffs in New York today are actually higher than those on Nov. 5, 1918, when the whole world so joyously welcomed the apparent termination of the great conflict which had raged for 51 months.

To attempt to determine what is likely to happen in the future we must try to find the cause of the things which have happened in the past, and also to see whether this cause is or is not likely to continue in the near future. When prices began to advance in the opening of war, we could readily see that the upward movement was due to the urgent demand for the food and raw material required by the enormous armies which had been put into the field, and this cause has been designated the "scarcity demand"; but when we found the advance extending to many articles in which there was no scarcity, and which were not used by the armies or utilized in the manufacture of their requirements, we began to realize that a part of the advance must be due to some cause other than mere war or scarcity demands.

Edgar Crammond, the distinguished British statistician and economist, in an address before the London Institute of Bankers on Mar. 26, 1919, stated that the three facts which would tend to make the fall in prices a very gradual one are: (1) The vast increase in the amount of paper money; (2) the huge increase in the amounts of public debts of the belligerents; (3) the determination of labor to maintain wages and improve the standard of living.

Raw silk, for example, for which the war made no special demand and which was produced on the side of the globe opposite that in which the hostilities were occurring, advanced from \$3 per lb. in the country of production in 1913 to \$4.50 per lb. in 1917, and over \$6 per lb. in the closing months of the war. Manila hemp, also produced on the opposite side of the globe, and not a war requirement, advanced in the country of production from \$180 per ton in 1915 to \$437 per ton in 1918.

Mechanically ground wood pulp, not a war requirement, advanced from \$14 per ton in the opening months of the war to \$35 per ton in the opening months of 1916, and the grade known as "chemical bleached" advanced from \$50 per ton at the beginning of the war to \$100 per ton in January, 1919. Goat skins,



from China, India, Mexico and South America advanced from 25c. per lb. in 1914 to over 50c. per lb. in 1918, and yet goat skins were in no sense a special requirement of the war.

Pig tin, produced by Chinese labor in the Malayan Peninsula and the Dutch East Indies, and not to a very great extent a war requirement, sold in the country of production in 1914 at 30c. per lb. and in the same markets at 75c. per lb. in the closing weeks of the war.

Sisal grass, produced in Yucatan, advanced from \$100 per ton in 1914 at the place of production to nearly \$400 per ton in 1918, and Egyptian cotton, a high-priced product, and thus not used for war purposes, jumped from 14c. per lb. in Egypt in 1914 to 35c. per lb. in 1918. Even the product of the diamond mines of South Africa advanced from 60 to 100 per cent. in price per karat when compared with prices existing in the opening months of the war.

The prices which I have quoted to you are in all cases those in the markets of the country in which the articles were produced, and in most cases at points on the globe far distant from that in which the war was being waged. They are the product of countries having a plentiful supply of cheap labor and upon which there has been no demand for men for service in the war. The advance in the prices quoted is in no sense due to the high cost of ocean transportation, since they are those demanded and obtained in the markets of the country of production.

Why is it that the product of the labor of women and children who care for silk worms in China and

\*Paper presented at meeting of the Editorial Conference of the New York Business Publishers' Association, Hotel Astor, New York City, Apr. 11, 1919.

Japan, of the Filipino laborer who produces the Manila hemp, the Egyptian fellah who grows the high-grade cotton, the native workman in the diamond mines of South Africa, the Mexican peon in the sisal field of Yucatan, the Chinese coolie in the tin mines of Malaya, or the goatherd on the plains of China, India, Mexico or South America has doubled in price during the war period? The articles enumerated were in no case for use in the war, and the prices are those in the country of production and thus not due to the increase in ocean freights or dangers of oversea transportation. The advance has been general, world-wide. In a few articles in which an over-production was occurring, in which the demand fell below normal, the advance was not so strongly marked; but there is scarcely an article in the long list of those entering world markets in which there has not been an advance, no matter how distant its place of production from that in which the war was occurring or how little the war's demands for it or for the labor by which it was produced.

Surely there must have been some general underlying causes for this world advance, this simultaneous demand by people of all classes and in all parts of the globe for higher prices for their products irrespective of their relation to war requirements. While we may be willing to accept the immediate demands of the war as a partial explanation of the advance in the prices of foodstuffs and certain manufacturing material and manufactures, we must look further for the cause of the similar advance in articles upon which the demands of the war could have had no direct bearing. It is true that a marked advance in the price of one important class of products does cause an advance in the prices demanded for other articles which must be exchanged for those in which the advance has already occurred, but it does not seem probable that the advance due to scarcity of a comparatively few of the world products required for war could have been the chief cause of the doubling of prices in practically every article produced in every part of the world, many of which had not the most remote relation to war requirements.

Apparently the principal causes of the advance in prices during the war were, stated in their chronological order, first, "scarcity demand"; second, the advance in wages presumably due to the increased cost of living and demand for labor, and, third, the large increase in world circulating media, or, to put it in a single word, "inflation." Professor A. C. Miller, member of the Federal Reserve Board, an authority whose views are entitled to high consideration, in a recent address before the American Academy of Political and Social Science, named as the two chief causes of the advance in prices "scarcity demand" and "inflation," adding that "there is so much evidence of an artificial abundance of money in comparison with the things

that are purchasable by it that the abundance of money must be credited with at least an equal influence in explaining the high prices which have prevailed."

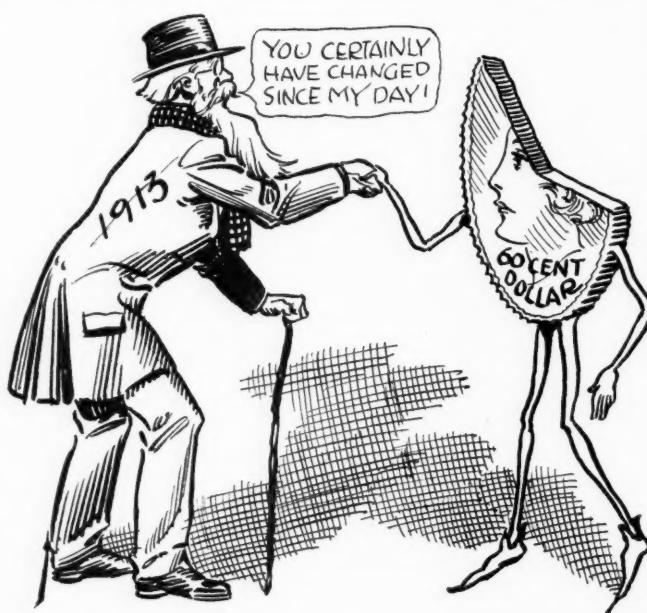
What were the articles for which the war created a scarcity demand? Food, clothing, transportation facilities and material for the battlefield. How much did it add to the world's demand for these articles? Of course, the percentage of increase in demand for strictly war materials was very large, but was there really as great an increase in demand for other materials, food, clothing and transportation facilities as we are accustomed to imagine? Let us assume that the number of people participating in the war was forty million, which is probably more than those in the field at any

one time. Do we realize how small a share those forty million were of the world's consuming population? Less than 2½ per cent. We think of forty million as a large number of people to feed, and so it is; but it must be remembered that the number of people in the world who must be fed and clothed and supplied with transportation facilities every day of the year is 1,800,000,000, or 45 times as many as the highest number in the military service at any time during the war. Of course, the soldiers were better fed than are many of the people in certain sections

of the world, but even if their per capita consumption was four times as much as the average it would still represent but a small percentage of the world's daily food consumption. And it must be further remembered that all these 40 million people in the armies had been consumers of food before the beginning of the war, not to quite so great an extent perhaps as after entering the activities of the military service; but it cannot be assumed that the war added 40 millions to the world's consumers of food and clothing. Nor can it be properly assumed that the withdrawal of these millions from the industries actually reduced to that extent the world's producing power, for four millions of these were already in the military service and the places of the other 36 million were to a considerable degree filled by others who had not been up to that time actively engaged as producers.

Much of the material used in preparing the supplies for the battlefield was "switched" from the usual lines of industry, for there was an immediate cessation of railway construction, building operation and a thousand industries which formerly required manufacturing material; and as a result of this cessation of activities the material formerly used by them became available for war purposes.

It thus appears on close analysis that the scarcity demand created by the war was not so great in food, clothing or manufacturing materials as has been pictured, while the fact that 15 millions are still under arms minimizes the reduction in military demands which had been expected.



One factor often mentioned in the attempt to determine the causes of high prices is the advance in wages of labor, but the fact that the increase in compensation of labor was in most cases given because of the fact that the cost of living had already advanced at least somewhat minimizes the relative importance of this factor in attempting to discover the real causes of the general world-wide advance in prices. And it must also be remembered that several million persons who had not been engaged in the industrial and business world came to the assistance of those engaged in these duties during the war.

Where, then, shall we turn in the search for the principal cause of the general advance in prices of articles produced the world over and their relation to the demands of the war. What other cause can we find after giving due consideration to the scarcity demand, the destruction by war and the increased cost of labor? The most prominent among the possible or probable causes is the theory advanced or accepted by the historians, economists, statisticians and financiers of the world that inflation in currency is usually accompanied or closely followed by an advance in prices; and, as already indicated, so high an authority as a member of the present Federal Reserve Board, Professor A. C. Miller, has recently declared that "the abundance of money must be credited with at least an equal influence in explaining the high prices which have prevailed."

I wonder if we do fully realize the quantity of paper money which the responsible governments of the world have put afloat since the beginning of the war—thirty-six billion dollars. The paper money in existence in the 15 principal countries of the world at the beginning of the war was less than eight billion dollars, and at the end of the war was over 44 billions, an increase of 36 billions in 51 months, and this does not include any of the 80 billion dollars worth of paper currency issued by the Bolsheviks in the 18 months of their control in Russia. Thirty-six billion dollars of new paper money added to the circulation of the world by 15 responsible governments in a little over four years of time!

#### ADVANCE IN PRICES DUE TO PAPER CURRENCY

We had been inclined to charge up the advance in prices occurring prior to the war to the fact that eight billion dollars worth of gold was turned out by the mines of the world in the 20 years following our famous gold and silver campaign of 1896. But here are 36 billion dollars worth of paper promises to pay turned out as legal tender money by 15 responsible governments in a short four-year period.

Do we realize how vast a sum is this 36 billion dollars worth of paper currency which has thus been put into circulation in such a brief time? It is more, in its face value, than all the gold and all the silver turned out by all the mines of all the world in the 427 years since the discovery of America.

True, much of this paper money is now more or less depreciated in its value as compared with gold, the world's accepted standard, but the fact that it has behind it not only a certain amount of the yellow metal but also the pledge of the governments by whose authority it was issued renders it at least an accepted medium of exchange in the countries of its origin, while the fact that nearly every neutral country of the world has meantime increased its paper currency and national

indebtedness, permitting its gold to pass from circulation into the vaults of its banks as a security for the paper circulation, tends to widen the field affected by this inflated currency.

In addition to these vast sums of legal tender currency turned out by 15 responsible governments of the world, these same governments have at the same time made an even more spectacular advance in their issue of another series of promises to pay, which, while not legal tender in the ordinary sense of the term, do form a more slowly moving mass of currency. By this I mean the 180 billion dollars worth of bonds or other forms of national obligations issued by the governments of the world in the past four years, for national debts of the world have advanced from 40 billion dollars at the beginning of the war to 220 billions at its close. And while these bonds or other governmental promises to pay money at some future date are not legal tender currency in the ordinary sense of the term, they do pass current in the financial world and prove a basis upon which money may be readily obtained by their holders, and to this extent are an addition to the world's circulating medium.

#### BANK DEPOSITS SHOW ENORMOUS GROWTH

Still another increase in circulating media is found in the enormous growth in bank deposits, which of itself increases circulation through the increased use of checks, especially in countries such as the United States, where the check forms so large a share of the daily business transactions of the country. Bank deposits in 15 principal countries of the world have grown from 27 billion dollars in 1913 to approximately 75 billions at the present time, the ratio of increase being about the same as that of currency.

These increases, in circulation, indebtedness and bank deposits, while occurring chiefly in the countries participating in the war, have also extended to many other countries, especially in Europe, where the six principal neutrals have during the war period increased their national debts one billion dollars, their note circulation over a billion dollars and their bank deposits by about one billion.

Thus in a short 4½-year period world paper money has increased 36 billion dollars, world evidences of national indebtedness 180 billion dollars and world bank deposits nearly 50 billion dollars. Most of this enormous increase has occurred in "uncovered" paper. The gold mines of the world have turned out less than two billion dollars worth of the precious metal during the war period and most of the world's gold, which formed 55 per cent. of world circulation at the beginning of the war, has passed into the vaults of the governments of their great banks as a basis for their paper currency, and now bears a relation of but about 20 per cent. to the flood of paper money in circulation; and this proportion of gold to paper varies widely when the respective countries are compared.

If the world's historians, financiers, economists and statisticians are right in their general belief that an advance in prices usually accompanies or closely follows inflation in currency, and especially in paper currency, can we be surprised at the world-wide advance in prices which we have witnessed during the past four years, in which world currency and bank deposits trebled and national debts quintupled?

We come now to the third and final question, that of

prices of tomorrow. May we expect a material reduction in general prices in the near future? And in trying to determine this we must see whether the causes which brought about the advance during the war period are likely to be removed.

The chief causes of the advance seem to have been the scarcity demand, the higher cost of labor and the increase in circulating media.

The scarcity demand came on the very first day of the war, for most of the countries entering that struggle found that the demand upon them would be far in excess of their supplies either of foodstuffs or military requirements; and as the weeks and months and years progressed this fact was more strongly impressed upon them.

During the closing year of the war the ammunition factories of the various participating countries were able to meet to a great extent the requirements of their own armies, but in the matter of foodstuffs the scarcity demand still continues, with little prospect of abatement, at least in the near future. The number of mouths to feed in Europe has not decreased, and that continent, which has not for many years been able to produce its own requirements of foodstuffs, now finds itself with neglected soils, a disordered population and unable to return to normal production in the immediate future. In manufacturing materials, for which Europe has also been dependent upon other parts of the world, she will require abnormally large quantities at least in proportion to her attempts to manufacture, for her stocks of this class of merchandise are absolutely exhausted. In all parts of the world which have relied upon Europe and the United States for manufactures the shelves are empty and must be filled, and most of the manufacturing sections of Europe will evidently be slow in resuming the production of manufactures for exportation, and will have limited facilities for transporting or marketing them even if produced. So it seems that, although the demand for war material has terminated, the other features of the scarcity demand will continue, at least in a somewhat modified form in the immediate future, especially as relates to world requirements of food, manufacturing material and manufactures, while developments thus far do not point to an early reduction in labor costs.

If we are right in assuming that a considerable proportion of the world advance in prices is due to the enormous increase in world currency, can we expect a marked reduction in prices until the cause, inflation, is removed? Or, to put it in another form, that part of the advance caused by inflation can only be cured by deflation, by a

reduction in the enormous stocks of currency which, as I have shown you, have trebled during the war, while that other form of slowly moving currency, governmental obligations, has quintupled.

Is it probable that these two forms of currency can be or at least will be reduced in the near future? The governments of the world, which were paying less than two billion dollars a year of interest on national debts at the beginning of the war, are now paying and must continue to pay a total of over 10 billion dollars a year in interest, and at the same time all other expenses of governments have advanced. Official estimates of the budgets or expense accounts of several of the principal countries for the coming fiscal year have already been announced and indicate that their necessary expenses in the first full year of after-war peace will be about four times as great as in the year preceding the war. The British budget for the next fiscal year is estimated at about six times as much as in 1913, and those of France, United States and Canada about four times as much as before the war. Present indications are that the governments of the world will be compelled to collect in taxes from their people about 50 billion dollars a year as against about 12½ billions in 1913, or say a billion dollars a week as against a billion dollars a month before the war; and this does not include anything for sinking funds or other provision for reduction of outstanding debts. If this be true, is it probable that the governments in those countries which have greatly increased their circulation and must now demand such enormous increases in annual payment of taxes will find it advisable or possible to materially reduce the amounts of currency available for such payments?

If the governments which have been the chief participants in the world increase of currency should fail to materially reduce that excessive supply, and if the world's demand for food, manufacturing material and manufactures is to continue at the present rate, are we justified in expecting a general reduction in prices in the near future? The question, I think, answers itself. There will, of course, be instances in which there will be material reductions, but in general terms the outlook for marked or rapid decline, at least in the near future, does not seem so very encouraging.

While there may be a downward trend in the general price level and distinct reductions in certain articles, the difficulty in removing the chief causes of the advance suggests that the general reduction in prices in the near future may not be as rapid as some people have anticipated.



## Mining Congress Tackles Export Problem

A meeting of the coal-export committee of the American Mining Congress, of which Henry M. Payne, of the Bertha Coal Co., is chairman, met at a luncheon, Saturday, May 3, held in the rooms of the Machinery Club, 50 Church St., New York, James F. Callbreath, secretary, American Mining Congress, occupying the chair.

It may be said from the outset that the purpose of the American Mining Congress, as expressed by its secretary, is not to add another element of confusion to that already existing in regard to the export problem. The purpose of the Congress is to serve all elements in the industry, and to bring about coöperation between them. The wholesalers have discussed or are discussing the problem; the National Coal Association has attacked it without arriving at definite conclusions, and the United States Bureau of Mines has its own suggestions formulated.

There is a risk of cross purposes, and to avoid any such unfortunate outcome the American Mining Congress, the representative of all interests in the mining industry, is trying to use its coördinating influence. As Mr. Callbreath has well said, the American Mining Congress should serve to allay the present confusion and, should it fail to achieve such a result, it will cease all its attempts to interest itself in the export situation. When it has succeeded in bringing the representatives of the various interests to put their feet under one table its work will end, unless those interests seek its further assistance.

The principal of the informal talks was made by Allen Walker, of the Guaranty Trust Co. Mr. Walker has taken an active part in promoting export associations of many kinds under the Webb-Pomerene act. He stated that the foreign nations all had their export associations. Great Britain, at first, tried to do business without industrial coöperation. The salesmen on their arrival in foreign ports declared that they were not troubled so much by the activity of the German, Japanese or Frenchman as by the competition of their own countrymen. They advised a measure of coördination.

Wedded to their methods and their trade marks, and confident that their past activities had established for them an enviable reputation, the leaders in British trade resented these suggestions and sent other salesmen, men of larger caliber, but from them they received the same reports. Some of the companies even sent their executive heads to find out the true situation. They finally decided that the best way of handling foreign trade was by an association among all those in the industry. Thus transactions became simplified.

Did they want something of the Government, they approached the proper board with an authoritative and certain voice. There were no longer as many voices as there were exporting corporations. The associations were successful because they hunted in packs. They were busy seeking business and not in struggling for their share of it. The aggregate was larger, so there was more for all. The principle, according to Mr. Walker, should be "No national competition in the foreign field."

A large number of export associations have been formed already in all lines of business. The discus-

sions all started with the conviction that nothing could be done, that each producer would "paddle his own canoe." But ultimately the export bodies were formed and those who at first opposed associations most vigorously became the most enthusiastic of supporters.

Charles S. Keith, of the Central Coal and Coke Co., was in the beginning not at all favorable to the lumber export association, though he is a leading producer of lumber. He ultimately changed his point of view entirely, stating that if he did not sell a stick, a plank or a board of lumber abroad he would nevertheless be an enthusiastic member of the association, for he would realize that it helped him by removing the surplus production from the American market.

To continue to give the gist of Mr. Walker's address it may be said that much of the difficulty in the formation of export associations arises from the opposition of those who have expended time and money in establishing a reputation. Perhaps the goodwill thus created is not as important as the established exporter thinks. Still it is doubtless of some value. What there is of it should be saved. It would be suicidal not to sell at least for some time under trade marks well known in foreign trade. However, the association's name should accompany the trade mark of the individual member of the association. The allocation of orders gives no trouble. They may be apportioned according to the volume of previous foreign business, or in some other way.

### WALKER WOULD UNIFY VOICE OF EXPORTERS

There is an advantage in dealing with the Government as a unit, as the American Federation of Labor has shown. Labor has practically but one voice. Capital has had the voices of 793 associations with conflicting viewpoints. No wonder the American Federation of Labor with its clearly enunciated propositions has been heard, while the multiple voices of capital have been an unconvincing discord.

As an outcome the meeting voted "That the chairman be authorized and requested to appoint a committee, representing the several coal interests involved, such committee to prepare a report and recommendation for coöperative effort to be submitted to a general conference to be called by the chair." The committee appointed consisted of Henry M. Payne, chairman, representing the American Mining Congress; Allen Walker, acting as advisor; G. M. Dexter, representing the National Wholesale Coal Association; Thomas Ferrell, representing the National Coal Association; and Van H. Manning, representing the Bureau of Mines.

The committee on coal export which called the meeting consisted of Dr. Henry M. Payne, of the Bertha Coal Co.; Henry G. Brown, of Philadelphia; George F. Lee, of Wilkes-Barre; F. W. Wilshire, of New York; and J. P. Walsh, of Pittsburgh. Those present at the meeting were James F. Callbreath, Dr. H. M. Payne, W. T. Coe, representing Mr. Wilshire and London representative of the Consolidation Coal Co.; J. M. Lee, of the Lee Coal Co.; H. G. Brown, of the Blair-Parke Coal and Coke Co.; Allen Walker, of the Guaranty Trust Co.; George M. Dexter, of the National Wholesale Coal Association; Charles S. Allen, of the New York Wholesale Coal Association; R. Dawson Hall, of *Coal Age*; W. P. Harriman, of the Irving National Bank; George N. Reed, of the Newark Traffic Club; G. H. Montague, an attorney with a large knowledge of export business; Francis Caughi, of the Guaranty Trust Co.; Dr. H. Foster Bain, of the United States Bureau of Mines.

## Great Extension of Industrial and Scientific Research Shown in Great Britain

The Mining Association of Great Britain has under consideration the establishment of a single research association for the whole kingdom, to include coal sections or branches dealing with the problems peculiar to particular localities. Valuable work has already been done in this direction at the Doncaster Coal Owners' research laboratory, says the *Colliery Guardian*, and it is clear that there is ample scope for an extension of this work throughout the coal fields of the country.

Encouragement has been afforded for the establishment of research associations by the committee of the Privy Council for Scientific Research, which reports a considerable extension of the work of this new department. Over five million dollars are available to the support of such associations as need governmental financial assistance. But it is open to any industry to establish an approved association without seeking assistance from Parliamentary funds; such associations will be entitled to the same privileges as well as assistance by way of advice and information as those in receipt of a grant. Some hesitation has been shown to establish any relationship with the Government in connection with special researches because of the publicity such a course might entail; furthermore, it is not always desirable that such researches should be fettered by state control.

However, among the numerous schemes initiated by this committee a prominent place is occupied by the work of the Fuel Research Board. Buildings and equipment, estimated to cost over half a million dollars, are now in course of erection for this board; when they are completed a comprehensive chemical investigation of English coal seams is expected. This work, it is stated, should be under Government direction and control. It is not expected that it will clash in any way with the work contemplated by the National Coal Mining Research Association. The latter organization will presumably be mainly concerned with problems connected with the practical work of mining. Already some preliminary work has been undertaken in this direction, and grants have been made by the committee of the Privy Council to the Institution of Mining Engineers for investigations into the atmospheric conditions in deep and hot mines.

### Mining Men Will Meet in Chicago

The American Institute of Mining and Metallurgical Engineers will hold its convention in Chicago, Sept. 22 to 26. This meeting promises to be one of decided importance to coal men, for subjects of vital concern to the coal industry will be under discussion.

In addition to the technical talks, an elaborate social program is being arranged, and excursions by the institute as a body are planned to many points of interest in the vicinity, including the steel mills at Gary, the oil refineries at Whiting, metallurgical plants at East Chicago and North Chicago, and operations in the LaSalle district, where are many cement, coal and zinc industrial establishments. The producers of coal should get a glimpse of the manner in which other producers of raw materials solve problems similar to those which perplex the coal industry.

## Reception to Dr. Garfield

Of all staffs, few indeed are more enthusiastic than the staff that supported Dr. H. A. Garfield in the work of the Fuel Administration. The members of that organization feel that the operations of their establishment were always conducted for the sole good of the public, that no ulterior motives entered into the actions of their chief. "Without political ambition, without regard to the swarm of Senators and Representatives who sought places for friends, Dr. Garfield pursued the even tenor of his way," is the testimony of one of his associates, who spoke with the memory of a long term of service in the Fuel Administration lingering happily in his mind.

On Apr. 24 the members of the staff held a dinner in Dr. Garfield's honor at the Waldorf-Astoria, New York City. Thirty-eight of the staff, including the one they assembled to honor, were present. The invited guests were few: J. H. Wheelwright, president of the National Coal Association, W. K. Field, ex-president of that association, and T. L. Lewis, acting president of



BRONZE STATUETTE PRESENTED TO DR. GARFIELD BY HIS STAFF

the United Mine Workers of America. Unfortunately, Mr. Field and Mr. Lewis could not be present.

As an evidence of their affection and esteem, the staff presented Dr. Garfield with a bronze statuette of a miner backing up a soldier in the labors of the World War. It is a representation in bronze of the poster which obtained such a large circulation when production of coal was so much desired. It well serves to typify Dr. Garfield's connection with the winning of the great conflict.

No attempt was made to secure attendance of the large number of Dr. Garfield's admirers outside the Fuel Administration, or a larger banquet hall would have been filled to overflowing. It was a "homey" affair where the members of the staff who had worked together could meet in private converse. None of the speeches was given to the public. The souvenirs contained an admirable photo-engraving of the chief and of the bronze statuette illustrated in this article. On the facing page will be found an illustration showing the guests assembled to do Dr. Garfield honor.



### Dinner Given to Dr. H. A. Garfield by His Washington Staff, New York City, April 24, 1919

Commencing on the right and passing to the left: W. A. Williams, H. A. Cochran, A. C. Dodson, S. B. Thorpe, C. H. Means, G. E. Howes, L. Mitchell, J. F. Mulqueen, Rembrandt Peale, A. W. Calloway, H. Nusbaum, T. B. Gregory, M. L. Requa, J. H. Wheelwright, W. B. Symmes, Dr. H. A. Garfield; W. E. Hope, J. D. A. Morrow, A. M. Ogle, N. S. Schroeder, G. N. Snider, A. M. Macleod, C. C. Marvel, J. T. Lynn, C. B. Nichols, W. A. Marsh, S. B. Crowell, F. E. Harkness, F. M. Whitaker. Up the center between the tables starting from the foot of the table, E. M. Snyder, W. C. Hull, G. N. Allen, H. D. Nims, G. F. Macgregor, J. H. Allport and E. Q. Trowbridge. R. V. Norris and A. F. Hebard came in later, the former having to preside at a dinner at Columbia University.



## Investigating Site of North Dakota Experiment Station

The North Dakota lignite field now is being studied by O. P. Hood, so as to determine the advantages of various prospective sites for the lignite experiment station. Mr. Hood is the Bureau of Mines engineer who is in charge of lignite investigations which will be made under the Special Act of Congress passed at the recent session.

The Texas field already has been visited and hearings conducted at Houston, San Antonio, Austin, Waco, Dallas, Ft. Worth and Hoyte. The last named place is the location of a lignite mine. The hearings in Texas developed the fact that an experiment station located there would have large financial assistance from local interests.

The interest shown by Texans in the lignite experiment station was much greater than was known to Federal officials prior to the hearings. It is due largely to the fact that Texas has a very serious fuel problem. Sources of coal are distant. The heavy increases in the price of fuel oil during the war has caused widespread concern. As a result the state is very anxious to make use of its extensive deposits of lignite.

The lignite experiment station is not on the auction block and it will be located at the point where the chances of success seem greatest. The appropriation of \$100,000 is regarded as too small for the work in hand, but Mr. Hood is determined that with it, and with such aid as may be forthcoming from the lignite industry, he will prove that lignite can be beneficiated so as to produce a commercial fuel.

## Would Combine America's Water Power and Coal Resources

The great war has unrolled the map of the world and hung it above the desk of every engineer and businessman. As a consequence American efficiency must be brought to higher standards. One of the best ways that this can be done is to hitch up America's coal and America's water power. To this effect spoke George Otis Smith on Apr. 16 in the course of his address at the meeting of the Engineering Society of Western Massachusetts, meeting at Springfield. An extract from his remarks on that occasion is as follows:

The phase of conservation that best meets the present day need is conservation of energy; and engineering efficiency has been defined as conservation of labor. Indeed, when the advocate of the supertransmission project proposes power economy for the industrial region extending from New England southward, what he really has in mind is economy

of human energy. Displacing steam-generated power with water power or saving coal in the central station instead of wasting it in the small out-of-date local plant are not to be thought of simply in terms of economy in coal. We look back of the coal and see the miner and the fireman. Every ton of coal saved is the 1/900th of the miner's year's toil saved; thrift that is well worth while, if that amount of human energy thus saved is put to a better use. Labor-saving in general means a surplus of man-power available where it is more productive and hence more valuable and therefore worth the higher wage.

In the second place, industrial New England must plan to safeguard in every way its chief asset—skilled labor. Just as Emerson said that the Civil War had unrolled the map of the world and hung it above the desk of every engineer and businessman, we must now think in terms not of Massachusetts or of New England or even of North America, but of the whole world. Old England has for two years been working on this same plan of consolidation of power systems and centralization of power supply. And the reason for economy is outspoken: to meet American competition in the world markets. With more expensive fuel and practically no water power, England must get more kilowatts from the ton of coal and so reduce the power item in manufacturing costs. On the other hand, it is New England's clue to keep in the lead by making the power supply free from any danger of shortage, such as threatened us in the winter of 1917-1918 and by securing cheaper power and thus increasing its use by every industry. If the British engineers are planning an annual saving of 50 million tons in the fuel account of England, a tonnage twice New England's consumption of soft coal, our own engineers must meet this competition in industrial efficiency. Since modern machinery multiplies man-power, cheap electricity is the only method of harmonizing high wages and low costs. Hitching up America's coal and America's water power most efficiently is absolutely essential if America's standards of living are to be maintained. The super-power plan thus becomes a large item in the human-welfare program.

George S. Pope, who has been in charge of the fuel division of the Bureau of Mines for the past several years, has been appointed chief engineer of the new government fuel yard located in Washington. Coal for the use of government departments in the capital will be stored and handled in this yard.

Coal dumped at tidewater in the Pocahontas region of the Railroad Administration is only slightly less at this time than it was a year ago, according to a report to the Director General of Railroads from the regional director. Coal and coke loadings for other than tide-water destinations, however, have shown a decrease averaging 5000 cars weekly. The regional director in the southern district reports an increased movement of coal from the Alabama district which has been made possible by an improvement in the labor situation.

## EDITORIALS

### Inflation of Currency and Prices

**W**HENEVER buyers have much money they can buy much goods, provided prices have not changed. But buyers compete with each other and, given a fixed productivity, prices will rise till the ability to buy reaches a normal level. With prices, wages also rise. This is one theory of price inflation, and quite a reasonable one.

The difficulty is to tell what is money. Certainly gold, silver, nickel and copper currency may be so classified, and so also may paper money. There is, moreover, an equivalent to money in bank deposits, which form the basis of an exchange of credits, making the use of real money unnecessary. Bonds which are readily negotiable, especially Government bonds, are also instruments for credit. A degree of credit, furthermore, adheres in all securities entitled in any way to that name. As a result of the number of media for exchange it is hard to tell just how much money-equivalent may at this or any other time be available. There are degrees in exchange ability, the quality being dependent on the security and on its varied conditions during its life. The use of a security for a medium of exchange rests also upon the readiness with which the public can and will use that security as a basis for credit.

For these reasons, it is hard to evaluate the amount of money and money substitute now and before the war. But Mr. Austin, in an article read before the Editorial Conference of the New York Business Publishers' Association, and appearing on another page of this issue of *Coal Age*, certainly showed that the medium of exchange had far more than doubled. It would seem that it should have become cheapened, therefore, far more than one-half. But money has not been so greatly cheapened, as everyone knows. The price of things in general has been increased about 55 per cent. The medium of exchange is therefore depreciated to about 64 per cent. of its old value. It would seem, then, that a still further adjustment with higher prices is likely. The reduction in values so long expected by some people cannot come till currency is deflated, and that time is extremely remote. Meantime prices must rise.

This is an uncomfortable fact to all of us, especially to those who have saved money and have not purchased real property; and also to those who have to face increased prices without increased income. But it will certainly make for business progress, as the worst thing a man can do under such circumstances is to forbear to buy. The more real property the individual purchases, the

more his wealth will accrue; the more money and evidences of indebtedness such as mortgages he retains, the poorer he will become.

To recite the change in conditions: The quantity of currency with which the world's business is transacted has trebled in volume since the world war first began. Where before the war there were 40 billions of dollars of Government securities, now there are 220 billions, or 5½ times as much. Where in 1913 bank deposits were 27 billions of dollars, now they are 75 billions, or nearly three times as much. All these facts suggest that the trail of high prices does not just at this moment have a horseshoe bend. It is, at least for the nonce, a straight-away and not a kite-shaped track.

*You can't cut prices. Why then assume the other fellow can? He, like yourself, has cut prices already to the quick.*

### We Never Were a Nation of Quitters

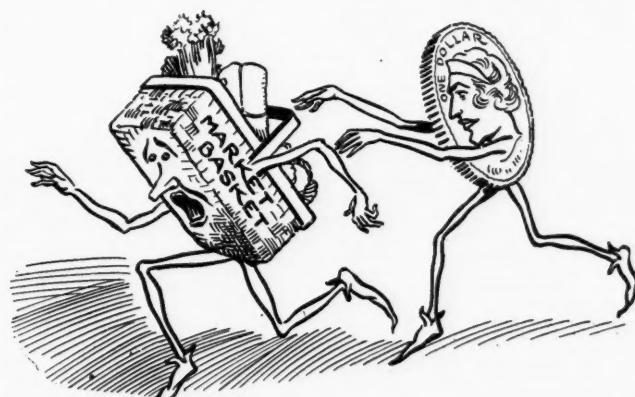
**A**NATION, like an individual, is successful if it has the courage and devotion to carry entirely through those emprises in which it engages. The higher the emprise, the greater should be the determination that, once commenced, it shall not be spoiled by a too feeble will. We must carry on, as a distinguished French statesman declared, "till the last quarter of an hour."

It is said that our Allies are a little wearied and disposed to give way to reaction. A little letting up, a little mental and moral sagging has been detected in ourselves. The soldiers want to come back home, and their parents are eager for a chance to welcome them. We want to spend as we spent in earlier days. We do not want to skimp, but to live our lives as in less frugal times.

But we must finish up the mess which the war has left. We must meet the bills for material on which labor has been expended. We must pay those who have fought for us, provide for the insurance of the dead and wounded, take care of the sick and restore to industry those who are blinded or lamed by battle.

Those who have been crying "Stand by the President" have still a chance left to do so. We do not need to follow him in all his policies. Some of them may seem somewhat at variance with those he has formerly advocated, some may seem hardly the best under the circumstances. But what of it? We agree with him at least in the age-long practice of paying our debts and in the unquestionable duty of taking care of our boys.

Honesty is the best policy



DOLLAR WILL NEVER CATCH UP  
Since the market basket got war training the dollar has never been able to overtake it

always. It is needless, however, to recite this fact as a reason for providing for the payment of our debts. Still it is true, and worthy to be recorded as an interesting, though hardly relevant fact, that a successful floating of the Victory Liberty Loan and a consequent prompt payment of our debts will ease the industrial situation and replace much dangerous idleness by healthy activity.

The staff of every coal company should take peculiarly to heart the appeal now being made for the purchase of Victory bonds; for operating staffs have received for the most part large increase in wage during the war and, earning steadily, have every opportunity to save money. With the mine workers the problem is more difficult. The brain workers, therefore, must be asked to do everything in their power to make up for any deficiency in the subscriptions of the manual laborers, whose time is now broken. It is certain that larger purchases could have been made by industrial workers had they been disposed to greater frugality. At most mines the subscription to the previous loans barely reached \$10 per month per man. Such a purchase would today, with slow time, more nearly represent the greatest sacrifice possible; but it can in most cases be made, and it will be borne with comparative ease when the coal market again becomes busy.

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*If we depress the prices of others we shall depress our own prices. As the Italians say "One hand washes the other." The close-fisted purchasing agent, at this present time, is wrecking other people's business as well as his own, and he doesn't get his lower prices after all.*

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### Use Judgment in Floating Liberty Bonds

OUR NATIONAL honor is engaged to the buying of the present loan. We owe it to the returning soldiers—and yet more to those who will never return—that every bond be subscribed. We also owe to the returning soldiers employment and, as far as may be, steady employment. The slogan of the Department of Labor is "For every star, a job." It is a splendid sentiment; every employer, every buyer will do well to heed it. A printed copy of it might even be put on the desk of the chief of the Railroad Administration for his admonishment. But that is neither here nor there.

The bond issue must be bought and to this end all our spare funds should be dedicated. Those who are in receipt of salaries and wages should buy in installments as largely as they possibly can and pay for the bonds as fast as they are able, by a large measure of self-negation. Do not fear that by such self-denial the retail traders and those trades which feed them will suffer and men be laid idle. Those industries are even now doing well. All the luxury trades are booming. They have no reconstruction woes. Theirs are rather reconstruction joys and triumphs. The only troubles they have are growing pains. Their wings can be clipped, not a little but much, and no harm will be done anyone.

But the call to drastic economy in buying does not apply to all industries. We need to keep business going for the returning soldier. Thus it is not advisable to avoid expenditures for building, because the building trades and the basic industries dependent on building need stimulation. To erect a house or factory is a patriotic—and profitable—act, especially if the payment

is spread over a period of some months or years.

A man questions in his mind whether he will buy Liberty Bonds or build a house for rent. He has no available savings, but he is in a business which brings him in \$1000 a month in excess of frugal living costs. The house could be built for \$2000. If he could spread the \$2000 over 10 months, the house would cost only \$200 a month, he could then pay \$800 a month for Liberty Bonds and so buy \$8000 worth. If, however, he decided to pay for his house with the first two months of saving, the building would interfere with the purchase of four times its value in Liberty Bonds. Rather than do that he should forego his building and buy \$10,000 worth of Liberty Bonds and thus put his whole ten months' income at the disposal of industry. It would be still better for him to put the whole \$10,000 in the building of five houses and thus afford shelter to those who find such accommodation increasingly hard to secure.

The same rule applies to larger and smaller investments. We should aid languishing industries by purchases, for that will be as great a national help as buying Liberty Bonds, provided the payments for the work effected will be spread over as long a time as would be the payments for the Victory Bond.

It is to be regretted that the new Liberty Bond issue did not provide for some expenditure on behalf of the reestablishment of business. It is a pity that when the soldier returns he should find the National Government ceasing to make all kinds of perfectly normal purchases.

Something has been said about the danger of compelling the banks to carry the national indebtedness. It is said that for the good of business they should not buy too large a proportion of this Victory issue. There is certainly a danger to industry should they purchase too many bonds, but it is true also that the needs of industry will be small if no construction is attempted.

We were almost betrayed into writing "America first" as our rule. Perhaps a better maxim would be "Our valiant American defenders first." We owe them a job therefore let us do our utmost to provide them with it. If we don't want to build a house or a workshop or buy machinery or coal on time payments, then let us buy Liberty Bonds to the limit. But if we can arrange to give work directly to the boys who jeopardized their lives in our service or if we can do it indirectly by stimulating the industry in which they work let us do it. They saved us. Let us now take off our coats and fare forth to serve them.

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*If the salaries of purchasing agents were raised we would have prosperity in a hurry. They just simply "can't see" high prices, because they are not getting the high wages to meet them. This fact is the reason for their soreheaded pessimism.*

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We hear it questioned whether there are compensations for the grim cruelties of war. Certain it is that there are compensatory pleasures in surrendering our own wills for the nation's benefit. The Liberty Loan still has a few days to run. Still there are a few hours during which we can put our patriotism to the acid-test. Not what we want to do with our money is the question, but what the nation needs. One more triumphant effort, one more surrender to the public welfare before peace is signed! Let us say we kept the faith to the very end.

# THE LABOR SITUATION

EDITED BY R. DAWSON HALL

## General Labor Review

Slackness of work in the bituminous region has made strikes less frequent than they would otherwise be in that portion of the field. Men are always keener for work when there is not a great amount of work for them to do. In the anthracite region with the prospect of steady work comes the prospect of strikes about every little matter.

Thus at the Bellevue mine of the Lackawanna Coal Co. the men struck Apr. 28 owing to the discharge of two men who are said to have been dropped without cause. As a result 1500 men were laid idle. In Apr. 29 a strike rendering about 500 men idle occurred at the Drifton mines of the Lehigh Valley Coal Co. Apparently the company had loaded an excessive amount of coal produced by company or day hands, which is known as "company coal." The miners felt that this company coal reduced their own possibilities of earnings. There was also a dispute as to sheet-iron and dead-work charges. However, the Buck Mountain and Eckley "feeders" of the Drifton colliery continued at work.

It is surprising that Chris. J. Golden, the union president of District No. 6, has declared for Government ownership of mines. With the steady work in the anthracite region and the prospect of a continued shortage of coal it is also strange that he is advocating the six-hour day with five days a week. He is looking to establish the closed shop. He wants a 100 per cent. organization, no man to be employed who will not pay dues to the union. He hopes that all this will come about in 1920. The contract cannot be made till April of that year, but when the time comes to contract for the labor of the anthracite mines he would have these terms inserted. He says he will sign no agreement that does not concede them all.

Representatives of the employers of the State of Pennsylvania and representatives of the labor employed in that state were unable to reach any agreement at a conference on Apr. 28 regarding proposed increases in the schedules of compensation benefits. The employers took the position that they were willing to support the proposed changes in the administrative features of the compensation law, but declined to discuss amendments increasing benefits.

A conference with the Governor when representatives of the employers and labor will lay their case before him will be held next week, and whatever the outcome of the scheduled conference may be the labor people are determined to make a fight for an increase in benefits.

On Apr. 28 the big strike of the Southwest mine workers came to an end, the miners securing all their demands.

### Labor Opposes Undue Price Reduction

While, during recent weeks, there has been a lurking suspicion in some parts of West Virginia that certain operators were cutting prices to a point below the cost of production, it was not until the publication about Apr. 25 of the prices at which a few operators in the Fairmont and northern West Virginia fields had sold coal during April to certain railroads that such suspicions were verified.

When the prices were published not only was there a vigorous protest from other producers but the representatives of the United Mine Workers accused the Director General of Railroads of bad faith, directing specific attention to his promises that no reduction in the selling price of coal which would affect the wages of labor would be encouraged.

When it became known that certain operators were selling coal at \$1.60 a ton, H. E. Peters, district organizer, District 17, in charge of the Fairmont office of the district,

gave out the following statement: "One of the most interesting reports current today is to the effect that operators in the Fairmont field have been selling, and contracting for the sale of, coal at less than \$1.75 per ton, which is ridiculously below the price of coal in the Fairmont field, as fixed by the Government, which price was \$2.50 per ton.

"Past and present experiences demonstrate conclusively that Fairmont coal cannot be mined and sold and present wages maintained at these prices. There must be some sinister motive back of this movement that seeks to reduce the selling price of coal in the Fairmont field. If the motive is to reduce the cost of production by reducing wages, then the officials of the United Mine Workers of America wish to serve notice on operators of the Fairmont field, here and now, that we will not stand for any such reduction. There is a temporary depression in the coal trade but that fact should not be taken advantage of or used as an excuse to cut prices. The operators who do so will bring a curse upon their own heads.

"Walker D. Hines, General Director of Railroads, has advised the international officials of the United Mine Workers of America that there would be no reduction in selling price, which would affect the wages of the miner and he also promised that there would be no unfair advantages given to one group of operators over another. Railroad coal would be purchased in general markets at general market prices.

"We are suspicious that there are some sharp practices between Mr. Hines and individual operators in the Fairmont field and we wish to advise them again that this is no time to even attempt to revive these old and unfair competitive conditions."

### Arkansas Labor Union Loses Bache Case

It will be remembered that the Coronado County Mining Co., Franklin S. Bache, president, a company operating in Sebastian County, Arkansas, sued the United Mine Workers of America for damages incurred when members of a local union made a raid on the property of the company located at Jamestown, Ark. A judgment was given for \$600,000, three times the damages sustained, that being the proportion required by the Sherman Anti-Trust Law when by a conspiracy damages are inflicted on one who appears later in court as a plaintiff.

To the \$600,000 was added \$120,000 for interest so that the total was \$720,000. The decision was rendered by a jury in the United States District Court, sitting at Fort Smith, Ark., November, 1917. The mine workers appealed, and arguments on the appeal were heard in St. Louis last December. The United States Circuit Court of Appeals handed down on May 2 a conditional affirmation of the judgment rendered by the District Court.

Judge Trieber, with the concurrence of Judge Sanborn, in his opinion dismissed all the assignments of error made by the miners' counsel with, however, one exception. Judge James D. Elliott, who tried the case in the District Court four days before the case went to the jury and four days after the case came up for trial, granted the coal company the right to ask that interest be added to the judgment.

Judge Trieber ruled that this fixing of the interest to be added, while the trial was in progress, was an error. He ordered that the coal company, within 40 days, file a remittitur of this interest. Unless this is done, the decision says, the case will be remanded to the District Judge for re-trial. Judge Hook handed down a dissenting opinion in which he said the case should be remanded because of instructions given by Judge Elliott, which had the effect of coercing the jury into returning a verdict in favor of the coal company.

# Leave Your Explosives Outside

*Safety Letter of  
Consolidation Coal Co.  
To Its Safety Committees.*

**R**ECENTLY, at a neighboring mine, a miner set down a keg of powder in the blacksmith shop. As is only too usual, he had punched a small hole in the top with his pick. The blacksmith was making a weld as the man set down his keg. A red hot spark flew in the open pick-hole and set off the powder.

One man was killed instantly and another horribly burned. Just a moment of carelessness, but it cost one man his life and frightfully mutilated another. The hole that was open in the top of the keg was not over a quarter of an inch wide and yet a spark which might have landed anywhere in the shop chose this little quarter of an inch of space for itself and found its way into the powder.

The unexpected, the improbable or the seemingly impossible, not only can happen but does happen frequently. You cannot depend on luck to prevent accidents. You must prevent accidents by not taking chances. Explosives are made to explode,



that is their business, and you would be the first to complain if they failed to explode. In the interests of your safety, rules have been made concerning explosives. They must be stored in a safe place. Powder jacks must be air-tight and a top must be kept on them. Blasting caps must be kept separate from other explosives. These rules are only the teachings of common sense, and if common sense teaches you that you must not stick a lighted match into a keg of powder, does it not teach you just as plainly that you must use constant care in handling your explosives from the time you receive them at the magazine, until you explode them in the blasting of your coal?

## DISCUSSION BY READERS

EDITED BY JAMES T. BEARD

### Perils in Reconstruction

*Letter No. 6*—In reading the several letters that have appeared in *Coal Age*, regarding the work of reconstruction following the great war, I have tried to view the question from the angle of each writer and beg to offer a few thoughts of my own.

All will agree that we have entered a new world in which changes follow each other so rapidly that, before we can adapt ourselves to one set of conditions new ones arise. The period of reconstruction following the great war is already here and has brought with it difficult problems that are proving troublesome to adjust satisfactorily. Many of these problems are without precedence to guide us in dealing with them. Their solution will call for the exercise of the best qualities of patriotic and thinking men. The business opportunities in the industrial world are such as have never before been witnessed.

The remark of Thomas Hogarth, *Coal Age*, Feb. 13, p. 333, appeals to me as practically correct. He says, "Before there will be any great change for the better, we shall experience a change for the worse," and we are now experiencing that prediction. The industrial world, today, is almost paralyzed, the condition being one of expectant waiting. Thousands of working men are idle. Our own mine, employing 100 men, shut down recently; and the mines in many other places are working but half-time, a number being closed for lack of orders.

Facing this industrial paralysis, which it is hoped is only temporary, are the high prices of provisions, clothing and other necessities of life. The high cost of building materials of every kind has caused the cessation of all work of construction, except what is absolutely necessary. Merchants decline to purchase more than what will satisfy their present needs, fearing a general drop in prices. Even iron furnaces are run only to fill urgent orders. How long this state of affairs will continue can only be suggested.

#### PATRIOTISM AND THE LABOR QUESTION

My thought is similar to that expressed by Joseph R. Thomas, on page 332, of the same issue to which I have just referred, where he says, "We are now facing a crisis that will demand the best judgment of miners and operators alike. The most difficult of the problems liable to arise is the adjustment of labor questions." It is my belief that the present labor problem is a serious one and its adjustment must, to a large extent, depend on the patriotism of both capital and labor.

Never has there been a time, in the history of our country, when a mutual spirit of coöperation was more needful than now. Labor must bear in mind that it cannot destroy capital and live, and capital must remember that to crush labor is to despoil its own usefulness. Both are vital forces in the industrial world and must work in harmony, displaying a spirit of patriotism and common sense, in order that each may live and prosper.

War conditions have spoiled manufacturers and producers, as well as wage earners. Such was the demand for labor that men without skill received from \$6 to \$8 a day for attending a machine that almost any boy could operate. The common hatchet-and-saw carpenter was paid from \$5 to \$7 a day for his labor. Producers of all classes of materials and supplies made enormous profits, amounting to 200 and 300 per cent. on the cost of production.

These conditions now no longer prevail, and it is difficult for men to get down to the old pre-war prices. Labor is restless, and a new basis of values will have to be established, before any adjustment of industrial problems can be reached. To avoid serious consequences, however, there should be no reduction of wages, until the cost of living has been reduced. Then, as Thomas Hogarth has remarked, "let us look boldly at these perils and do what we can to overcome them before they are upon us."

In closing, allow me to say that we shall come nearer to the true solution of our problems through the exercise of good business sense and patriotism, rather than by attempting legislation and adopting extreme views and methods. It is well to be optimistic, but there is danger in an optimism that is not warranted in the world of facts. It is not possible to operate a coal mine long on optimism alone. Let us start right and allow our business sense to prevail, making it possible for all classes to live and prosper.

JOHN ROSE,  
Dayton, Tenn.      Former District Mine Inspector.

### Correct Accounting

*Letter No. 3*—A recent writer in *Coal Age*, speaking of mining costs, reveals the prevailing disgust or dislike that many mining men manifest when discussing costs of operation. I refer now to the letter of Thomas T. Brewster, which appeared in the issue, Mar. 13, p. 501.

While it is readily admitted that no amount of pen-and-ink work will render a physically unfit or poorly managed mine profitable, it is yet possible to humanize and make clear the cost of operating even the smallest mine, by adopting an accurate method of accounting for all equipment and material purchased and in use. Even allowing that what supplies and equipment are purchased during the year will be paid for by the year's business, let me ask if that is any reason why this year should be burdened with the expense due to the purchase of material and equipment that will be used for years to come?

Moreover, as suggested by the editor, who has added a few comments on this letter, how would it be possible to show the present condition of the operation, or arrive at a proper valuation of the property, if the plant were suddenly destroyed by fire and the book accounts were all that remained to tell the story? Suppose, for a moment, a haulage motor is purchased at a cost of \$9000, and let it be assumed that the machine

has a probable life of five years; it would certainly be unfair to have the tonnage for the purchase year pay the capital sum of the cost of the motor, while the remaining four years are charged only with its cost of maintenance and repairs. Can anyone deny that it would be more fair to distribute the first cost of the motor so that each year of its life would bear the due proportion of that cost?

My opinion is that buildings and other equipment that become a permanent and improved part of the plant should be charged as capital invested, since they are an asset that must be reckoned in any future valuation of the property for the purposes of sale or insurance. All rails, timber and other supplies needed for daily use should be charged as supplies to the stock or supply account and only carried to the expense account when taken out and used.

However, it is important to remember that a system may be as complex as you choose to make it and yet fail of the desired effect if the actual operating heads of the different departments are indifferent or incompetent. The question of how large a stock of castings or supplies must be carried is one to be decided by each manager. But, ample supplies are insurance against idleness and often prevent very costly delays.

—, Penn.

SUPERINTENDENT.

## Firebosses as State Officials

*Letter No. 3*—In the issue of *Coal Age*, Mar. 20, p. 544, Robert A. Marshall asked to hear what arguments can be advanced for and against the employment of mine firebosses by the state. While I can think of no good reason why firebosses should be thus employed, a number of reasons suggest themselves in opposition to such a plan.

In the first two paragraphs of his letter, Mr. Marshall sets forth clearly the necessity of the employment of firebosses, who he claims should be considered as acting in the capacity of "mine examiners." He states that he is not in favor of their employment by the state. In his third paragraph Mr. Marshall argues that "these men should be in the mine during the entire day."

### ANALYZING THE SITUATION CAREFULLY

Now, it is well known that most state laws require that the firebosses shall examine the mine before the men enter the mine for work in the morning, and a few state laws require, besides, a second examination to be made by the same or other firebosses during working hours, while the men are in their places. In my opinion, it is obviously out of the question to expect that the firebosses making the first examination, in the early morning, shall remain in the mine throughout the day. Furthermore, that is not necessary, inasmuch as most if not all state laws require the mine foreman and his assistants to look after the safety of all men employed underground.

In addition to the arguments already set forth against the employment of firebosses by the state, I want to ask why it is not just as important that mine foremen and assistant foremen should be likewise employed by and under the authority of the state. All of these officials are charged with the same duty of caring for the safety of the men who work in the mine. For a failure to discharge those duties, any of these officials can and should be prosecuted. It is my belief, however, that their employment by the state would neither em-

phasize these duties nor insure their faithful performance.

On the other hand, assuming that the fireboss is a state official, would it not be true that it would remove him from the jurisdiction of the foreman and prevent the latter being held responsible for the conduct of the mine, in respect to its safe operation? Would not such a condition of divided authority result in a lack of mine discipline?

Under the present system, state authority in mines is represented by the state mine inspectors, who are charged with the duty of seeing that all mining operations, in their respective districts, are prosecuted safely and in compliance with the requirements of the law. It is up to the state inspectors to see that any violators of the laws are punished.

### PRACTICAL EFFECT OF STATE EMPLOYMENT

Let me say, here, that a state-employed fireboss, having an exaggerated idea of his own importance and clothed with state authority, could cause a mine foreman all kinds of worry and trouble and seriously hamper operations in the mine. There is hardly a question but that some firebosses, if clothed with such authority, would not be slow to make their presence felt, in which case relief would be hard and slow to obtain.

To my mind, there is no more reason for state-employed firebosses in mines than for our state-employed factory and mill inspectors being used as operatives and made a part of the organization of the factory or mill. State mine inspection is a very proper and necessary precaution and safeguard, and is welcomed by every well-meaning mine operator. But, there would be strong objections to the presence of state-employed operating officials in the mines. Let me say emphatically that the mine foreman is and, properly should be, responsible for the safe operation of the mine; but he cannot be charged with this responsibility without he has full authority over everyone employed underground.

EDWARD H. COXE, Gen. Mgr.,  
Braznell, Penn. Snowdon Coke Co.

## Exhaust from Steam Pump

*Letter No. 3*—Referring to the question of disposing of the exhaust steam from a pump located in a mine, allow me to cite an instance of this kind that occurred in a mine where I was employed some years ago. The pump was located in the bottom vein and handled all the water coming from the four veins above. The heat from the steam pipe that supplied the steam to the pump, and from the pump itself, together with the annoyance of the steam exhausted into the airways, made it necessary to resort to some means of disposing of the exhaust in some practical way.

The arrangement of the mine was such that it was possible to carry a split of fresh air through the pump-room, after which it was conducted, by means of an air bridge built over the main intake airway, directly into the main return and passed out of the mine. Another split of fresh air was carried directly to the men working east and west of the main slope. Notwithstanding these facts, however, such was the heat caused by the pumping arrangements that the men were forced to strip to the waist while at work.

The plan that was adopted to overcome this difficulty was as follows: A condenser was provided and placed in the main airway, at a point where a 4-ft. dam was

built across the airway. The dam is always full of water, which is permitted to flow over the top of the wall and run a short distance down the airway to the sump. The exhaust steam from the pump, which was located about half-way between the sump and the dam, was conducted to the condenser at the dam where it was condensed and passed off with the water. The cold water continually flowing into the dam kept the condenser cool and enabled it to do its work.

Previous to building the dam and erecting the condenser, the exhaust steam from the pump had been conducted into the sump below. But, by this arrangement, the sump water was kept in a boiling condition, which greatly interfered with the efficiency of the pump. I should also state that another dam was built in the airway at a point below the sump, so as to prevent any water from running further down the slope.

Although it is not stated in the inquiry that started this discussion, where the pump is located, my advice to the assistant superintendent is to try and conduct all the hot air and steam, from the place where the pump is located, directly into the return airway. Steam or hot moist air almost invariably makes a dangerous roof condition in a short time. As a general thing, it acts also on the pillars and entry ribs, causing them to crumble.

RICHARD BOWEN.

West Pittston, Penn.

**Letter No. 4**—Referring to the inquiry regarding the question of whether the exhaust steam of a mine pump should be conducted into the suction or into the column pipe, *Coal Age*, Mar. 20, p. 549, let me say that I agree fully with the editorial reply given on the same page.

As there explained, the exhaust of a mine pump operated by steam is often conducted directly into the tail pipe of the pump, but using the precaution to enter the pipe at a point sufficiently below the pump to insure that the steam will be injected into the water. Then, with a little care in starting the pump, there should be no trouble from back pressure or pounding.

On the other hand, however, should the exhaust connection be made with the discharge pipe, water-hammer would result and water would undoubtedly flow into the pump through such connection.

In addition to the above, let me suggest attaching some form of a condenser to the exhaust pipe, which will not only increase the power of the pump but require less speed to run it and obviate the disadvantage of exhausting into the air or even into the suction pipe.

Of course, the use of a condenser on a small pump that is used for local pumping only, is not economical; but wherever any considerable pumping is to be done in the mine a condenser should be installed.

Sugarloaf, Penn.

JOSEPH LAWRENCE.

## Cost Reduced in Machine Mining

**Letter No. 2**—Since reading the letter of John H. Wiley, *Coal Age*, Mar. 13, p. 501, I have been looking for something further on the matter of cutting coal with machines. To my mind, it is certainly a subject that should interest all coal men, and I cannot but feel that others than myself were surprised at Mr. Wiley's statement that his cutters "easily cut from 15 to 20 places in a single night." That is going some and certainly speaks volumes for either the cutters or the machines.

While not familiar with the machine he mentions or the "special bit" used in that machine, I made a little calculation somewhat as follows: Assuming that Mr. Wiley's machines cut an average of 18 places, 20 ft. in width, in 8 or even in 9 hours, this would mean  $18 \times 20 = 360$  ft. cut, or an average of 45 ft. an hour ( $2\frac{1}{2}$  places), for an 8-hour shift; or 40 ft. an hour (2 places), for a 9-hour shift.

All mine bosses should read Mr. Wiley's letter to their cutters. He states that he has installed two machines, the performance of which has more than exceeded his expectations, no machineboss being required to look after the machines and keep them in good condition, as the machinemen themselves easily repair their own machines.

If these machines are new, they should not need much attention in the way of repairs. But, let him wait until the mine has developed sufficiently to require 10 or 12 times that number of machines. Most of them will then be old and need frequent repairs, and things will not be apt to run along so smoothly. This is not to say, however, but that machinework is far superior to pickwork, both in economy and output.

As an illustration of what some machinemen are doing, let me cite an instance, by way of contrast. Only a few days ago, while waiting for the mine foreman to come out of the mine, I was approached by a big strong-looking fellow who was seeking a job. He claimed to be a coal cutter and stated that he had been working in a mine only a few miles from here.

In response to my inquiry as to the cause of the man's leaving his old place, he said that he had no good boarding place. He added that he had a good job cutting by the shift and admitted that he was paid for a whole shift whether he cut one or five places, the latter being the largest number he had cut in a single shift. At that moment, the foreman came in sight and I was glad to tell the man that he had better stick to his old job and left him with that advice.

### TWO POINTS OF INTEREST IN MACHINEWORK

There are two things worthy of note in Mr. Wiley's letter. In the first place, he should have given a full description of the special bit used in the Sullivan machine he mentions. It must be the particular form of the bit that enables those machines to cut from 15 to 20 places in a single shift. A description of the bit would be of interest, and I hope this will be forthcoming in some later discussion.

Another point to which attention should be called is the amount of bottom coal that Mr. Wiley says they are leaving. When using the Sullivan machine, it is possible that it may be necessary to leave "from 4 $\frac{1}{2}$  to 5 in. of bottom coal"; but this is not required in the use of the old Goodman machines that we have at work in our mines.

With us, the cutters are expected to catch the bottom on the back of the cut, while leaving but 2 in. at the front where the cut is started. I wonder if it has ever occurred to Mr. Wiley that the leaving of 5 in. of bottom coal when making a 6-ft. cut across a place 20 ft. wide means a loss of  $\frac{5}{2}(6 \times 20 \times 80) \div 2000 = 2$  tons of coal, which is then left in each place. Or, when cutting an average of 18 places a night it would mean the loss of 36 tons left as bottom coal, each shift.

We are all anxious to know how to reduce costs in getting out coal and will gladly receive any suggestion

having that as its object. There is nothing new in the superiority of machines over pickwork. But the avoiding of delays in the movement of the coal from the face to the tipple is an even greater factor in reducing the cost of operation.

In our mine we are doing everything possible to keep the roads in good condition, so as to prevent wrecks and expedite haulage. Machine bosses look after the machines and make needed repairs; an electrician supervises the power lines, sees that the rails are well bonded, and attends to other electrical matters; the foremen and firebosses look after the ventilation of the mine, which is provided with a good ventilating fan and good air-courses.

Our men are not required to work in bad air or wet places and are promptly supplied with all needed material in their working places. They do not need to hunt in other places for timber or rails, and are not kept waiting two or three days for a switch to be laid before they can get cars up to the face. By attention to these details, we try to increase the daily output of coal, which will certainly reduce the cost of operation.

McIntyre, Penn.

THOMAS HOGARTH.

## Efficiency of Mine Officials

*Letter No. 7*—For some time past, my duties have been to study the organization of industrial plants both large and small, and it has given me great pleasure to note the drift of the discussion in *Coal Age*, relating to the efficiency of mine officials.

Long and close observation has convinced me that, in nine cases out of ten, when a foreman is upbraided by one of his superiors in office it is not the foreman who is at fault as much as those above him. The real source of the trouble can generally be traced to the fountain-head, which may prove to be the general manager or even the president of the company.

The average coal-mining man will claim that, almost without exception, the mining of coal is fundamentally different from the work in other industries. It will be explained that the complexity of the operations necessary to extract coal from the ground and prepare it for the market makes it difficult to operate a coal mine on an especially efficient basis. That this is a fallacy has been proved by the success of men who have made the greatest advances in coal-mining methods and practices.

### CRITICIZING THE HIGHER OFFICIALS

The thought of criticising the president or general manager of a large coal company may cause a feeling of horror. While it is known that these high officials have often been severely arraigned behind their backs, few have attempted to lay the blame for low production, or increased cost of operation, on the shoulders of these higher officials.

Let me say, here, that I am not a disgruntled foreman, a disappointed salesman of mine equipment, an unsuccessful efficiency engineer, or a minority stockholder. I am simply a man who has had the privilege of traveling through many coal fields and interviewing many coal officials, in an unofficial capacity. In other words, I am an "observer," without prejudice or malice. From this viewpoint, allow me, then, to give a few illustrations prompted by my personal observations:

Suppose, for instance, the management of a large bakery hires capable bakers but supplies an inferior flour or yeast and, on receiving complaints from cus-

tomers regarding the poor quality of the bread, went into the bakeshop and upbraided the bakers, only to be told that it was the flour or the yeast that was to blame, and he replied, "A d—poor excuse for a baker to offer when his bread is poor." But, it is just as foolish to expect that any good foreman or superintendent can produce results in a mine when he is not provided with suitable tools and equipment for the work.

### DEFECTIVE POWER DISTRIBUTION AND POOR EQUIPMENT CAUSE LOSS IN TONNAGE

As another illustration, let me cite a large coal company operating two mines, one in Ohio and the other in Alabama. The Alabama mine falls far short of producing the results attained in the Ohio operation. The management calls for an explanation and is promptly informed by the Alabama superintendent that he has not the power required to haul the coal.

An examination of the books, however, shows that the Alabama mine has apparatus that will give twice the electrical energy available at the Ohio plant. The prompt dispatch of an electrician, from the home office to Alabama, results in the discovery that the distribution system at the mine is defective, the installation having been poorly made, which is causing excessive line losses. Here, also, the blame for the poor results obtained in the Alabama mine should rest on the shoulders of the management, who alone were responsible for the equipment of both the mines.

Below the "Mason and Dixon line" there are, to my knowledge, four mine superintendents who, for the past three years, have been wanting certain equipment that would enable them to produce a much larger tonnage for the same cost of operation, besides keeping a more satisfied lot of men. The arguments of these superintendents, however, have fallen on the deaf ear of a general superintendent who is an autocrat. While he tells his men that they can have anything they want, their requisitions sent to the office are regularly changed to conform to his own ideas and inclinations.

This same high official, at the time of a recent election, absented himself an entire week from his office, being more concerned over a \$1500 bet he had made on the election than about anything connected with the mines. Notwithstanding these untoward conditions, the aforesaid superintendents are being constantly upbraided for their failure to produce the increased tonnage demanded by the president. Speaking plainly, in this case, the president of the company is responsible for the general superintendent employed by the company, and is the real man who is to blame for the lack of tonnage produced at these mines.

Other instances could be mentioned where the high officials of companies are the ones to blame for the inefficiency of those in charge of operations in their mines. It has been said that "He who scorns with a lordly air the suggestions of his subordinates will, if given enough rope, eventually hang himself." The saying aptly applies to coal mining, and expresses the demotion or ousting of a number of gentry whose names have been adorned with high-sounding titles.

Within the past two weeks I have noted the passing of an assistant manager whose subordinates had all been forced to lead a dog's life. For 14 years this official had occupied, not to say held, a job, being the oldest man in point of service though young in years and without experience. For six of those years, he had acted as assistant manager. Any new idea that chanced to be

brought to his attention by one of the men was sure to be greeted with a sarcastic remark and an aggravating smirk. He had "thought of the same thing for years and turned it down as not being practicable." In fact, he threw cold water on everyone who served under him and was a veritable joykiller.

The change produced by the successor to the man just mentioned was indeed remarkable. The newcomer is a young man also, but possessed of different characteristics. Taetful and bright, he never thinks that he knows *all* about anything, but gives sincere consideration to any suggestions coming from his men. His maxim is "No man can make a success of any job, unless he lets the other fellow help him run it," and he means every word he says.

#### EFFECT OF CHANGE IN MANAGEMENT

Soon after this new assistant manager took charge, another change for the better occurred, and no one felt sorry when, five days later, the superintendent was handed his walking papers. That official had been a particular friend of the "sarcastic dub" previously ousted, and had been getting fat around the waistband. He seemed fairly glued to his comfortable office chair, which he seldom left for a trip into the mine. Sitting in his office, his particular delight was to tell filthy jokes and yarns whenever he could get an audience. The company lost none of their assets when he was shipped.

The new superintendent who succeeded to the office is a fine type of Irishman—the kind of a man that makes everyone want to help him "put the job across." Though he is here, there and everywhere, he never seems to be in a hurry; but you can be sure that he knows what he is after when he starts for the tipple or the mine. There is no worry or fret, and he always has the time and humor to pass a word of greeting with the men. He is not a windjammer, but *he is efficient*.

It is unnecessary to say, in closing, that these changes in the official management of that company wrought a wonderful change in the operations in the mine and that this was quickly apparent on the monthly cost-sheet of the mine.

OBSERVER.

Philadelphia, Penn.

*Letter No. 8—Speaking of the efficiency of mine superintendents reminds me of an incident that occurred in my own experience, when it was my misfortune to have to serve under a superintendent who was what I would term a "grouch." Almost every time he came into the mine, he wanted to change some plan that I had started.*

On one occasion this super visited some pillar workings and stopped the work then in progress on eight pillars, explaining that it would only be temporary as he wanted to work out a plan of his own. I listened to his explanation and then told him that we had tried the same plan some time before he came to the mine and it had failed. This, however, did not satisfy him and, although our present plan was working successfully and we were troubled with very few "bounces," which had been such an annoyance previously, we were compelled to follow his instructions.

The result was just what I had expected. The bounces again occurred more and more frequently; and, I regret to narrate that we had one or more fatal accidents, lost considerable coal and lowered our daily tonnage before he was convinced of his mistake and would permit us to resume the plan he had interrupted.

There is no encouragement in working under such a superintendent. No opportunity is given to a foreman to show his ability, while he is always in a position to bear the blame of others' mistakes. On the other hand, it is a pleasure to work for a superintendent who is anxious to see what ability a foreman possesses and who leaves him to exercise his own judgment until he proves his inefficiency.

On another occasion, I worked under a superintendent who invited all his bosses to attend monthly meetings, for the purpose of discussing problems pertaining to efficiency in mining. He also held first-aid meetings, once a month, when men received training in first-aid work. Those who trained with breathing apparatus were given an allowance of two hours for the work.

There was a safety-suggestion box hung in the mine foreman's shanty, and the men were invited to put their suggestions regarding safety into the box. In this way, many useful ideas were evolved and greater efficiency resulted from the superintendent's efforts to educate and train his men.

#### WAYS OF INEFFICIENT SUPERINTENDENTS

Many of the so-called "hundred-per-cent. supers," today, are men who can get out coal, at a smaller cost per ton, without regard to the methods they use or the property they destroy. The cheap coal produced by these men is often the most expensive when a true estimate is made of the losses that follow the adoption of their poor methods of mining. The foreman is not allowed to pay out one cent for cleaning up falls in the air-courses, timbering travelingways and making certain necessary provisions for the safe drawing of pillars.

On the other hand, men are started to skipping entry ribs and room pillars, till these supports become too weak to carry the overburden, and a squeeze cuts off, perhaps, 25 or 50 per cent. of coal that should have been mined later but is now lost beyond recovery. In the working of a high seam, I have observed from 4 to 6 ft. of coal abandoned because the foreman was not permitted to pay two men, each, two days' wages to perform the work necessary to reach the coal.

Too often a superintendent who does not expect to remain long in his place will attempt to make a good showing by building wooden stoppings where rock or cement should be used, and buying second-hand material that will hardly outlast his time, all the while planning to let the other fellow bear the expense when he himself has gone.

My idea of an efficient superintendent is one who is a practical miner, from experience, and has a good technical education that enables him to be familiar with all the up-to-date electrical and mechanical appliances used in mining. He should be able to draw plans and superintend all work of installation or construction in and about the mine. He should be a good accountant so as to be able to make correct estimates and reports, both of work and material.

A superintendent should visit the mine regularly and often enough to be fully familiar with its requirements, and be able to discuss the work in hand with the foreman. Should a disaster occur when the foreman and fireboss are both in the mine, the superintendent should be able to lead the rescue work, by his knowledge of the workings and the ventilation of the mine.

CARBON.

[The discussion of "Efficiency of Mine Officials" will close with Letter 11, now on hand.—Editor.]

## INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD

### Mixing Acid Solutions

In preparing some electrolyte for lead and acid batteries, it was found that there was on hand two bottles of acid diluted with water to different strengths. The first bottle contained 12 per cent. acid and 88 per cent. water; the second bottle, 72 per cent. acid and 28 per cent. water. We required a solution containing 15 per cent. acid and 85 per cent. water and, there being no hydrometer available, it was necessary to calculate the proportion for mixing the two solutions on hand, so as to obtain one of the required strength.

If pure distilled water had been available, it would, of course, have been possible to dilute the stronger solution with water, until the required strength was obtained; but no suitable water was available. In the emergency, I remember a very simple formula was used to determine the proportions in which two solutions of different strengths should be mixed to produce one of a required strength. Can *Coal Age* give me such a formula and explain how it is obtained. I think this will be of interest to others than myself.

Pittsburgh, Penn.

ELECTRICIAN.

It is evident that a larger proportion of the weaker and a lesser proportion of the stronger solution must be taken in order to produce a solution containing a medium percentage of acid, greater than the first and less than the second. Hence, for every part of the stronger solution let  $n$  parts of the weaker solution be taken, making  $n + 1$  parts in all. The percentage of acid in the new mixture will then be expressed thus:

$$\frac{0.12n + 0.72}{n + 1} \times 100; \text{ or } \frac{12n + 72}{n + 1}$$

But, since the required mixture must contain 15 per cent. of the acid, we write

$$\frac{12n + 72}{n + 1} = 15$$

$$12n + 72 = 15(n + 1) = 15n + 15$$

$$15n - 12n = 72 - 15$$

$$3n = 57$$

$$n = 19$$

Therefore, it is necessary to take 19 parts of the weaker solution to one part of the stronger solution.

### Available Oxygen

Kindly explain why it is that a safety lamp will burn in the air, but not in carbon dioxide, when the latter actually contains a larger proportion of oxygen than the air itself. I am told that only one-fifth of the volume of air is oxygen, while carbon dioxide is two-thirds oxygen, by volume. And yet oxygen is the supporter of combustion.

STUDENT.

Holsopple, Penn.

It is true that carbon dioxide contains a much larger proportion of oxygen than air. The percentage of oxygen, by volume, being: Air, 20.9 per cent. and car-

bon dioxide, 66½ per cent. But, while the oxygen of the air is free or uncombined, that of the carbon dioxide is chemically combined with the carbon. In other words, the oxygen of the air is what is called "available oxygen," while the other is combined.

The combustion of the carbonaceous matter, in the burning of a lamp, depends on the amount of available oxygen present in the atmosphere surrounding the lamp. Where there is no available oxygen the lamp will not burn.

### The Halby Shoveler and Loader

I was much interested in reading the description of the Halby shoveling and loading machine, which appeared in *Coal Age*, Jan. 9, p. 67, under the title "Portable Coal Loaders."

Having recently contracted for driving a rock tunnel, 9 x 10 ft. in section, and including 4 miles of gangways, I would like to ask one or two questions relating to this machine. Our gangways must be driven half in coal and half in rock, as the seam of coal has a pitch of 45 deg. It occurred to me that if the Halby machine is applicable to such work, it would be of great assistance to me in the carrying out of my contract.

Kindly advise me which of the two types of the machine described would be best adapted to my work. Also, I want to ask if the front part forming the shovel of the machine is fixed so that it can move vertically. If it moves sideways, does the shovel *only* move or is it necessary to turn the whole body of the machine? Please inform me where I can secure a catalog of the machine.

E. N. ALLEN.

Newcastle, Wash.

As was stated in the article to which this correspondent has referred, there are two types of the Halby machine mentioned, the one being 6 in. wider and requiring nearly 18 in. more headroom than the other. The smaller of the two machines, known as the T700, is designed to work in a 5-ft. seam, while the other, the T600 machine, is adapted to higher openings. Both of these types have practically the same length; but in the smaller machine the power and truck sections are separate, while in the larger they are combined.

As stated in the previous article, the discharging conveyor at the rear of the machine is arranged, in the smaller type, to swing, so that it can discharge its material into a car standing on a track at one side of the machine. In the larger machine, the material handled can only be discharged into a car standing behind the machine and on the same track with it, or in direct line with the shovel.

As these machines are well adapted to the class of work mentioned by this correspondent, we do not wonder that his attention was arrested by their description, and we gladly recommend their use for the work in question. For a descriptive catalog, write the Lake Shore Engine Works, Marquette, Mich.

## EXAMINATION QUESTIONS

ANSWERED BY JAMES T. BEARD

### Bituminous (Penn.) Mine Foremen's Examination, Apr. 8-10, 1919

(Selected Questions)

*Ques.*—(a) For what does the bituminous mining law of Pennsylvania provide? (b) What is meant by the term "bituminous coal mine" and the term "excavation and workings"?

*Ans.*—(a) The bituminous mining law of Pennsylvania is an act intended to provide for the health and safety of persons employed in and about the bituminous coal mines of the state, and to secure the protection and preservation of mining property.

(b) In the meaning of the bituminous mine law, the term "mine" includes the shafts, slopes, drifts, or incline planes connected with excavations that penetrate the coal strata. The law continues:

"Which excavations are ventilated by one general air current or divisions thereof and connected by one general system of mine railroads over which coal may be delivered to one or more points outside the mine, when such is operated by one operator."

This addition to the definition of a mine would seem to exclude such excavations in coal strata as are void of ventilation, besides restricting the application of the word "mine" to excavations in coal strata that are operated by one operator, which is obviously not the intent of the law.

The expression "excavations and workings," in the meaning of the bituminous mine law, includes all the excavated portions of a mine, both abandoned and working, together with all shafts, tunnels and other passageways and openings, both in use and in process of making, together with their equipment of material and machinery below the surface of the ground.

*Ques.*—As mine foreman, what observations would you make in your daily examination of the working places?

*Ans.*—The mine foreman must closely observe every operation going on in the mine, to see that no unsafe practices are employed and that everything is done in compliance with the requirements of the mining law and the mine regulations. He must examine the condition of each working place to see that the roof is safe and the coal properly mined. He must give particular attention to the ventilation of the working faces and all abandoned areas and other void places in the mine, and see that there is no dangerous accumulation of gas and that all places are healthy and safe for work. He must see that there is a sufficient supply of timber and other material, on hand in the working places and that the same are being properly used.

*Ques.*—What are the principal requirements on haulage roads to insure the economic haulage of coal?

*Ans.*—Main haulage roads should be driven as straight as possible and have sufficient headroom and clearance at the side of the track to insure the safe and speedy movement of the cars. The track must be well laid and ballasted and the roadbeds drained. Where electric haulage is employed, careful attention must be given

to the bonding of the rails. As far as practicable, steep grades and sharp curves must be avoided on the haulage roads and no doors must be constructed at the foot of a grade where a motorman or driver may be unable to control the movement of the cars.

*Ques.*—In a certain mine where the heaving of the floor has thrown the track out of alignment and reduced the headroom so much that bottom must be lifted on the haulage roads or the roof shot down to permit the passage of mules and cars, the entries are driven 10 ft. wide on 40-ft. centers and rooms turned off the entries on 30-ft. centers and driven 24 ft. wide. What is the thickness of the room pillars; and, assuming you were taking charge, what suggestions would you make to eliminate these troubles?

*Ans.*—The chief cause of the trouble, in this case, appears to arise from the small room pillars, which are only 6 ft. in thickness while the rooms are 24 ft. wide. It would be better to drive the rooms on 40-ft. centers and reduce their width to 20 ft., making the thickness of the room pillars also 20 ft. If practicable, the entries should be driven 8 ft. wide, instead of 10 ft., as at present. All rooms should be turned narrow, the room-necks not exceeding 8 ft. in width and driven a distance of 10 yd. before the room is widened out. Every precaution should be taken to drain the workings and prevent the accumulation of water on the roads or in the rooms, which would soften the bottom and increase the trouble, if permitted.

*Ques.*—How would you render first aid to a person with a broken forearm?

*Ans.*—Having sent at once for a doctor, proceed to examine the injury and place the broken limb in as comfortable a position as possible, observing whether the break is a simple or a compound fracture. In the event of the latter, great care must be exercised to prevent the sharp splinters of bone from tearing the muscles and increasing the danger of the wound. If the injury is a simple fracture and the skin is not broken, however, there is little danger of the wound being infected, and the principal object, while awaiting the coming of the doctor, is to prevent any undue movement of the injured limb by binding it carefully to a temporary splint or otherwise securing it in a manner to prevent further injury from the broken bones penetrating the flesh.

It may be necessary to treat for shock, as indicated by the color of the face and a general depression or stupor of the injured person, approaching semi-unconsciousness. Hot coffee or hot tea should be given in small quantities at a time, or a half-tablespoonful of aromatic spirits of ammonia in a tablespoonful of water. If whiskey or brandy is the only stimulant available give but one large drink or swallow, as more may cause further depression. Smelling salts held to the nose is good. Avoid exposing the person to a cold current of air and protect him by a covering of coats or blankets to overcome the effects of shock when this is apparent from observation of the victim.



from the Spanish mines at Penarroya, Puerto-Llano and Asturias. As soon as trade conditions are normal again, however, the national product will not be able to compete with foreign coal, not only because of its very inferior quality, but also because of the increased railway-freight rates from the mines to Malaga. As it is, wood and "orujo" (the residue of the olives after extraction of oil) have been substituted for coal wherever possible.

The estimated annual consumption of coal in Malaga is 100,000 tons. On account of the mild climate other fuels are used in heating and cooking. With the exception of a part of the coal used by the Andaluces Ry., which has a very favorable contract with the Penarroya Coal Co., most of the supply used locally has been imported in the past from Cardiff and Newcastle. It is probable that English coal will continue to supply the market unless American exporters can sell their product laid down at Malaga at the same or better figures. This will largely depend upon freights.

The present is a very advantageous time for American coal to enter this market. Vessels would not have to return in ballast, but could, in season, obtain cargoes of olive oil, oxide of iron, almonds, essential oils, etc. The import duty on coal is 3.50 pesetas (\$0.67) per metric ton.

[A list of coal dealers and large consumers in Malaga, Spain, may be obtained from the Bureau of Foreign and Domestic Commerce or its district or co-operating offices by referring to file No. 113814.]

#### SWITZERLAND

[Consul H. H. Dick, Basel, Feb. 27, 1919] The prospects for the importation of American coal into Switzerland seem very good, providing the necessary colliers can be obtained to transport it. In normal times about 250,000 tons of coal are needed each month for all purposes in Switzerland. Practically all of this coal was formerly imported from Germany, although small quantities came from Austria, France and England. That from England was employed principally under control of the British Board of Trade, by industries manufacturing products for Great Britain.

Coal is absolutely necessary for Swiss industry. Without it industry must cease. Because of its shortage the Swiss railway officials have been forced five times to curtail traffic on the Federal railways, even eliminating all trains on Sundays and all express trains. Germany took advantage of Switzerland's situation and raised the prices gradually until June, 1918, when by a convention Switzerland was forced to pay double the former prices in Swiss francs instead of in marks, which had fallen in value. The prices per carload (10 tons) established in June, 1918, for coal at the mine were as follows: Bituminous from the Saar, 1900 francs (\$366.70); briquets or anthracite from the Ruhr, 2000 francs (\$386). In carload lots (10 tons each) the freight costs were as follows: Rail transportation from Saar to Basel, 115 francs (\$22.20); from Ruhr to Basel, 210 francs (\$40.53); rail and water transportation from Ruhr to Basel, 260 francs (\$50.18).

The retail prices based on these costs were: Bituminous from the Saar, 250 francs (\$48.25) per metric ton; coke (made at Basel), 300 francs (\$57.90) per metric ton; anthracite (assorted domestic), 270 francs (\$52.11) per metric ton.

Now that Germany is no longer in a position to force Switzerland to pay such prices, the effort is being made to arrange for delivery at greatly reduced rates, and thus convert into cash enormous stocks accumulated at the mines of the Ruhr. It will be difficult, however, for Germany to make delivery owing to a scarcity of rolling stock, as well as to existing internal disorders. Belgium has recently offered 600,000 tons of coal to Switzerland, and the importations from France and England are increasing. It is thought by various dealers that the prices for both German and Entente coal will fall to about 120 francs (\$23.16) per metric ton delivered at the Swiss frontier.

Dealers will be glad to receive offers for American coal, quoting prices c. i. f. Cetze, France or Rotterdam. The latter place is preferred, as coal can be transported either by rail or water directly to Basel.

[A list of coal dealers in Basel, Switzerland, can be obtained from the Bureau of Foreign and Domestic Commerce or its district or co-operating offices by referring to file No. 113690.]

An arrangement has been arrived at between Poland and German-Austria to prolong the agreement whereby Austria is supplied with coal from Poland. The tonnage thus supplied is still very small owing to the Dombrowa mines in Poland not having yet got into working order.

## Foreign Coal Trade Opportunity

The municipal authorities of a city in Austria who are in charge of the electric center, waterworks and tramway service desire to purchase coal, reports an American consular officer. Correspondence may be in English. Those interested may obtain further information by writing to the Bureau of Foreign and Domestic Commerce, Washington, D. C., or any of its branches and referring to file No. 29195.

## New Coal Rates to Europe

Announcement was recently made by the Shipping Board of new rates on coal from North Atlantic ports to various European ports of destination. The new and reduced rates range from \$22.50 a ton of 2240 lb. to \$31 a ton, with a guaranteed daily discharge of from 700 to 1500 tons.

The new rates as announced by the board were as follows:

	Coal per Guaranteed Ton of 2240 Lb.	Daily Discharge Tons
Bordeaux-Havre.....	\$22.50	700
Antwerp-Rotterdam.....	22.50	1000
Gothenburg (Sweden).....	26.50	1000
Copenhagen-Ronne (Denmark).....	27.00	1000
L'dskrona-Malmö (Sweden).....	27.00	1000
Oxelösund (Sweden).....	28.00	1000
Stockholm.....	28.00	1500
Marseille.....	26.00	1000
Genoa.....	26.50	1000
Naples.....	26.00	1000
Trieste-Fiume-Venice.....	31.00	800

Discharge as above indicated, with time counting 24 hours after arrival of vessel, whether in berth or not, Sundays and holidays only excepted. If discharge is not completed within the time specified demurrage to be paid at the rate of \$1 per net registered ton per running day, payable day by day.

These rates are not applicable on bookings made prior to announcement.

Homeward rates from above ports to United States ports, or commodity rates for homeward cargo will be established and quoted upon application.

## Coal Resources of Netherlands

Under date of Feb. 11, Minister John W. Garrett reports from The Hague that with a prolonged spell of cold weather the coal problem has again assumed a leading position in the Netherlands, and the question of that country's independence of foreign powers for its fuel supply is once more being actively debated. A few weeks ago an official report was issued estimating the coal resources of the country as 1,766,000,000 tons in the Peel district, 3,165,903,537 tons in southern Limburg, and 324,000,000 tons in the Winterwijksegebied. This makes a grand total of 5,255,803,537 tons of coal, sufficient to supply the Netherlands, at the pre-war rate of consumption of 10,000,000 tons per annum, for 525 years. None of this, however, is first-grade coal.

In addition to the question of availability of coal, the question of cost renders it of vital interest for Holland to achieve a

position of independence in this regard. Last year the price of coal in Limburg amounted to 17 florins (the normal exchange value of the florin is 40.2 cents) per ton, whereas Germany demanded 90 florins per ton. This year Germany has reduced the price to 50 florins; but, in view of the scarcity of coal throughout Europe as a result of greater demand and destroyed mines, no appreciable decrease in the price of foreign coal is expected at present.

## Will Ship Coal to Sweden

Coal will be shipped to Sweden by the Hutchinson Coal Co. operating in the Fairmont region of West Virginia, that company having recently secured a contract calling for the delivery of 10,000 tons to that country, the contract specifying that only lump coal shall be shipped. Heretofore little or no coal has been exported to Sweden, and the order placed with the Hutchinson company is regarded as beginning of an extensive coal trade with that nation. The order in question has furnished work for the miners at the Laura Lee, Mt. Clare and Erie mines of the company.

## Australia in Need of Coal

Advices from Melbourne under date of Apr. 21 state that owing to the quarantine due to the epidemic of influenza a serious coal shortage has resulted in Australia. On the date given there was only three weeks' supply of fuel on hand and many industries were threatened by a forced shutdown.

## London Secretary of American Chamber of Commerce

George P. Toby, long connected with banking and industrial corporations in this country, has been appointed Executive Secretary of the American Chamber of Commerce in London and will sail for his new post about May 12, meanwhile conferring with American merchants as to the service which the American Chamber in London can render them. Mr. Toby has been long known as an investment banker, and in this capacity has made a careful study of the operation of American industrial and public utility corporations.

G. M. Cassatt, president of the American Chamber of Commerce in London, who is now in the United States, in announcing the appointment explained that the London organization has as its members the representatives in England of American manufacturing and exporting interests, and also of the foremost British manufacturers and exporters, too, and importers from the United States. The former are active members, the latter associate. The Chamber has standing committees on finance, commerce and trade, transportation, trade information, etc., and the membership is also divided by businesses into trade groups, each working through its own committee. Thus almost any inquiry can be expeditiously handled by referring it to the proper committee or proper trade group.

"The London Chamber," Mr. Cassatt concluded, "wants to be used. What we most desire is that the individual American manufacturer, merchant, exporter from one end of the country to the other should learn to look upon us as an overseas service bureau of his own—on the spot and on the job, ready to work for him, to protect his hand and to look out for his interests. We are there to promote American business."

## Hampton Roads Coal Exports

NORFOLK		
Apr. 21 Amer. S.S. Lake Benton.....	Havana, Cuba.....	2,052 48
Apr. 22 Amer. S.S. Lewis K. Thurlow.....	Rio de Janeiro, Brazil.....	3,713 822
Apr. 22 Amer. S.S. Cristobal.....	Cristobal, C. Z.....	9,904 335
Apr. 23 Nor. S.S. Borghild.....	Gibraltar FO.....	4,859 489
Apr. 24 Amer. S.S. Moritz.....	Havana, Cuba.....	2,737 361
Apr. 24 Ital. S.S. Angiolina.....	Gibraltar FO (Italy).....	4,537 737
Apr. 24 Amer. S.S. Lake Shore.....	Rio de Janeiro, Brazil.....	1,815 688
Apr. 24 Amer. S.S. North Pines.....	Rio de Janeiro, Brazil.....	2,772 1,154
Apr. 26 Amer. S.S. Achilles.....	Cristobal, C. Z.....	12,154 996
Apr. 26 Amer. S.S. Oceano.....	Gibraltar FO (Italy).....	6,101 732
SEWALL'S POINT		
Apr. 23 Am. Sch. Dunham Wheeler.....	Rio de Janeiro, Brazil.....	2,904 ...
Apr. 26 Amer. S.S. Okesa.....	Pernambuco, Brazil.....	2,643 447
NEWPORT NEWS		
Apr. 21 Amer. S.S. Vinal.....	Santiago, Cuba.....	1,505 295
Apr. 22 Amer. S.S. Republic.....	Rio de Janeiro, Brazil.....	5,901 ...
Apr. 22 Amer. S.S. Lake Desha.....	Antilla, Cuba.....	2,934 367
Apr. 23 Br. S.S. Rimutaka.....	Wellington, N. Z.....	4,022 839
Apr. 25 Am. Sch. Cecilia M. Dunlap.....	San Juan, P. R.....	1,385 ...

## COAL AND COKE NEWS

EDITED BY ALEX MOSS

### Harrisburg, Penn.

Representative Donnelly of Schuylkill County has introduced in the House a bill (1320) requiring the delivery of explosives to miners in the anthracite region at points below the surface. The bill provides that on and after July 1, 1919, explosives to be used by the miners in the hard-coal fields shall be delivered to them by the operator at a point below the surface most convenient to their place of work. The quantity supplied to each miner shall be in accordance with an order left by such miner at the mine foreman's office the day previous, and the quantity not to exceed the amount provided by law. The bill also provides that any operator who fails or neglects to furnish explosives to the miners as provided in the act shall be liable to a fine of ten dollars for each failure.

A bill to regulate the weight of anthracite coal and imposing penalties for short weight has been introduced by Representative Norton. This bill states that on and after the first day of July, 1919, two thousand pounds shall make or constitute a legal ton of coal throughout the state. A fine of \$50 is to be made in all cases of short weight, provided that in all cases thirty pounds shall be allowed for the variation in scales.

A measure granting the right to corporations to construct and operate tunnels under the bed of navigable streams, where necessary to reach their coal supply, subject to the approval of the Water Supply Commission, was presented by Senator Crow of Fayette County, on Apr. 30.

A bill was presented to the House on Apr. 30 by Mr. Phillips, of Clearfield, providing that bituminous miners may collect at law rates due for mining coal, 76 lb. to constitute a bushel and 2000 lb. a ton. All mine cars are required to be uniform in capacity.

Five years without a single fatality in the mine under his care, is the record made by Harry Lewis, foreman of the Primrose colliery of the Lehigh Valley Coal Co., near Mahanoy City, and his work has been formally recognized by P. C. Fenton, State Mine Inspector in the Twentieth Anthracite District, who has written a letter of congratulation to Mr. Lewis.

Actual fatalities in the anthracite mines have decreased from 618 in 1913, to 551 in 1918, while the deaths per million tons of output have shrunk from 6.75 in 1913 to 5.54 in 1918. It has been the intelligent application of good mining principles and "safety first" ideas by the operating companies, through foremen like Mr. Lewis, which has helped to lessen the hazards of mining.

Mr. Lewis has been with the Lehigh Valley Coal Co. ever since 1897, when he was appointed fireboss at Packer No. 5. In 1904 he was made assistant foreman, and in 1910 he was made foreman at the Primrose colliery, which position he still holds.

### Charleston, W. Va.

Both operators and miners in West Virginia are up in arms over the developments of the last week or two in connection with railroad fuel purchases, the publication of figures showing that some operators in the state sold coal for April delivery for as low as \$1.60 per ton. The miners have denounced such sales in unmeasured terms and see in such a policy an effort to reduce wages, while operators are chagrined at the supine way in which some of the men in their industry have fallen in with the plans to beat down coal prices.

A large tonnage of coal was sold to the railroads at prices ranging from \$1.60 to \$1.85—a price considerably below the price fixed by the Government. Coal men who realize the organized effort being made to "bear" the coal market deplore the lack of organization and cohesion among those in the industry.

Aside from developments as to railroad fuel prices, the outlook for the industry in the state at the end of April was somewhat more encouraging. Certainly production had reached a somewhat higher level in many of the West Virginia fields, the im-

provement in a single week being pronounced.

It was estimated that in several districts the output had reached about 50 per cent of the full-time capacity. Larger quantities of coal were being moved both to the West and to tidewater, lake business having augmented the demand in West Virginia, production in several districts having been considerably increased as a result of a growing demand from lake territory. Even slack felt the effect of the growing demand, byproduct companies appearing to be in the market for larger quantities of this coal. Coke production, however, is still lagging.

### Fairmont, W. Va.

A perfect furor was created in the Northern West Virginia fields during the fourth week of April when it became known that eight or ten different companies had been selling railroad fuel during April for a price as low as \$1.60 a ton and from that up to \$1.85. Prices at which 61,000 tons of coal were sold by these operators to the New York, New Haven & Hartford Railroad Co. during April are as follows: A. McBeil & Sons, 8000 tons at \$1.85; George E. Warren Co., 10,000 tons at \$1.75; Antler Coal Co., 5000 tons at \$1.75; Har Mar Coal Co., 5000 tons at \$1.75; Knickerbocker Fuel Co., 10,000 tons at \$1.60; West Virginia and Pennsylvania Coal Co., 10,000 tons at \$1.85; Knickerbocker Fuel Co., 10,000 tons at \$5.74, that price being for coal delivered alongside Port Liberty piers, trimmed and bunkered. The fact that coal companies would become a party to the effort of the Railroad Administration to break down coal prices could hardly be credited.

There was a nearer approach to normal, however, in coal loadings during the week ending Apr. 26 than during previous weeks, coal men declaring that production was approaching 75 per cent, basing their estimate on the fact that the average loadings were 600 cars a day. It is even predicted that within 30 days shipments will have reached normal levels, though all do not concur in such a prediction, being rather inclined to believe that not before the end of the summer will there be full-time production.

The number of idle mines is still quite large, but it is apparent that a larger tonnage is being mined where mines are running. Increased fuel orders and increased lake orders have contributed to the increase in the total shipments from Northern West Virginia. Coal is moving to lake points at about the rate of 300 cars a week.

### Dallas, Tex.

Slackness in the coal-mining operations in Texas, Oklahoma and Arkansas at this time is bringing the people of these states and other states that look to them for their fuel supply, dangerously near the famine point, according to coal dealers here. Coal-mining operations have been slack throughout the season. Various causes have contributed to this. First, there has been a marked shortage of railroad rolling stock, which has made the transportation of coal next to impossible. This has been reflected in decreased operations at the mines. Second, there have been various labor disputes which have tied up various mines for considerable lengths of time, and there has been a dearth of miners in some localities, especially in Texas, where the miners found work in the newly developed oil fields more profitable.

Last year the domestic consumers were induced to purchase their winter supply of coal early, and thus the mines were kept in operation throughout the summer months. But this year the consumers have not so purchased their coal. Dealers say there will be a greater shortage of coal in the Southwest next winter than last year, unless the consumers are induced to purchase their coal supply during the summer months and the mines can be kept in operation.

According to some coal operators, the production of coal in the Southwestern dis-

trict must be increased at least one hundredfold if the threatened famine is to be avoided. These operators say the mine operations have so slackened that there is hardly any coal reserve on hand.

### Boise, Idaho

With the signing by Governor Davis of House Bill No. 40, there has been created in Idaho a Bureau of Mines and Geology which, if properly directed, should in time become an important factor in the development of the mineral resources of the state. The board of control of this bureau is composed of Governor D. W. Davis, as chairman; the president of the Idaho Mining Association; Jerome J. Day, of Moscow; the professor of geology at the University of Idaho; D. C. Livingston, the state mine inspector; Robert N. Bell, and the dean of the School of Mines; Francis A. Thompson, as executive secretary.

The initial appropriation is \$30,000 for the biennium, the general distribution of which is provided for by the act as follows: "For cooperation work with the United States Bureau of Mines, \$15,000 to be matched by a like appropriation from Federal funds; for co-operative topographical and geological work with the United States Geological Survey, \$10,000, which also is to be matched by a similar Federal appropriation; for general geological economic investigation of the mineral resources of the state, \$5000."

The new bureau will therefore be the means of expending in mining, metallurgical investigations and in geological and topographic surveying the sum of \$55,000 during the present biennium. The co-operative work in topographic surveying will be fully of as great a value to the agricultural and forestry interest of the state as to the mining industry, and for that reason the bill had the general support of all communities. Washington, Oregon and California each have a well organized survey of this kind and the creation of such a bureau of survey has been urged in Idaho for many years and has finally become a reality.

### PENNSYLVANIA

#### Anthracite

**Lofty**—The Lehigh Valley Coal Co. has leased coal lands in Carbon and Schuylkill Counties to the Dodson Coal Co. The tract is near this town and is also near the former Silver Brook colliery, which was operated 15 years ago by Wentz & Co., under the name of the Silver Brook Coal Co. The Lehigh Valley company has been interviewing miners and former officials of the Silver Brook company concerning their knowledge of the worked-out areas in the old workings of that company.

**Freeland**—Pennsylvania state agricultural officials have opened an office at this place, and are fighting the "potato wart" disease which has broken out in the mining villages surrounding Hazleton. The coal companies are cooperating by furnishing steam and other aids, in the fight against the disease.

**Hazleton**—The Cranberry Creek Coal Co., west of town, is changing its pumping equipment from steam to electricity and, where conditions permit, drill holes through the rock are being used as column outlets instead of the column lines formerly used.

**Berwick**—Four operations have been started to dredge coal from the Susquehanna River, and another party is preparing to do the same. All expect to get more coal from the river this year than formerly. A Scranton firm erected a washery on the east side through which river coal is run. It finds a ready market for the hundreds of tons taken out daily.

**Weatherly**—The Supreme Court of Pennsylvania, on Apr. 22 decided that where employees of a coal company are sent to a hospital for treatment for injuries by permission of a company, the latter is responsible for payment of the bills. The opinion was rendered in the case of the Middle Coal Field Hospital against the Lehigh Valley Coal Co.

**Wilkes-Barre**—As the result of a fire that started in the twelve east gangway of the Nottingham mine of the Lehigh & Wilkes-Barre Coal Co. at Plymouth on May 3, fifty men nearly lost their lives. All were brought to the surface, however, though many of the men are in a serious condition. The men were overcome by blackdamp, falling in rows along the gangway.

**Mahanoy City**—Deeds were recorded on April 29 conveying a large tract of land in Union, West Mahanoy and Butler Townships from Louis V. Gerhardt, of Paris, France, to the Wentz Corporation, organized and existing under the laws of Virginia and from the Wentz Corporation to the Raven Run Coal Co. The consideration in each case was \$28,333.33 and the extent of the transaction involved 37 and 21/27 twelve hundredths parts of the entire tract of 1200 acres.

**Freeland**—The Pond Creek Coal Co. will resume operations at its mine as soon as the colliery can be reopened. This mine was closed during the slack market period.

**Carbondale**—A petition has been presented to the city council by property owners of Canaan St., asking the council to restrain the Tappan Coal Co. from further mining operations until the mine fires which have been burning for several years be extinguished.

**Scranton**—Maintaining the rate established by court in 1916, the county commissioners of Lackawanna County have set the triennial assessment on coal lands in the county, which will stand until 1922, at \$300 per foot-acre. Coal lands in Lackawanna County under the present assessments, with a tax of three mills and a valuation of approximately \$57,000,000, bring in about \$175,000 in county taxes, about 80 per cent. of it being paid by the coal companies.

**Pottsville**—A cage containing ten miners dropped 1100 ft. at the Maple Hill shaft of the Philadelphia & Reading Coal and Iron Co. on May 5, resulting in the death of one miner and serious injuries to the nine others, two of whom may die.

**Minersville**—One of the greatest fires this region has ever seen is raging at the Lytle colliery timber and culm bank. Refuge timber and coal dirt from the mines has been thrown for years on this dump, almost mountain high, and fire, starting in the very heart of the bank, has such a stubborn hold that great streams of water have failed to extinguish it. The Susquehanna Collieries Co. has a large number of men fighting the flames.

**Dorranceton**—Two men were killed and three other workers injured on April 29 as a result of a gas explosion which occurred in the Pettebone mine of the Delaware, Lackawanna and Western R.R. Coal Department. It is thought the accident was due to carelessness on the part of one of the doorboys. The supposition is that one of the door tenders failed to do his duty in closing a door after a locomotive had passed through and thereby allowed gas to collect. It is believed that sparks from an electric locomotive ignited, causing the explosion. The explosion did not cause a fire, but completely wrecked a portion of the mine.

**West Hazelton**—The Alliance Coal Co. workings at Kaska William, which have been flooded with water for many years, will be freed by electric pumps now being installed.

#### Bituminous

**Uniontown**—The Whyley Coal and Coke Co., Harry Whyley, president, has purchased from the C. S. Bygate Estate of Pittsburgh, Penn., the 153-acre tract of coal known as the Whitehead tract in the Irwin gas coal basin in Westmoreland County, Penn., and is preparing to open a mine on it. It will require a shaft about 300 ft. deep and 6000 ft. of railroad.

**Waynesburg**—G. M. Scrugham, D. M. Hertzog and R. M. Hite, trustees of J. V. Thompson, in bankruptcy, have sold to the Cumberland Coal Co. a block of Pittsburgh vein of coal in the eastern part of Franklin township, aggregating about 1168 acres; consideration, \$450,654.30. W. Harry Brown, of Pittsburgh, has sold to the Buckeye Coal Co. one-seventh interest in four tracts of coal in Cumberland township; consideration, \$1. C. C. Jordan has sold to the Cumberland Coal Co. coal under a lot in Jefferson borough; consideration, \$257. Annie B. Luse, of Carmichaels, has purchased from Dr. W. M. Parry, of Waynesburg, and Dr. Roger S. Parry, of Washington, a tract of Pittsburgh vein coal in Aleppo township, containing 104.1675 acres; consideration, \$7,812.56. Dr. Roger S. Parry, of Washington, has purchased from E. E. White 104.1675 acres of Mapletown or Sewickley vein coal in Aleppo

township; consideration, \$1. H. G. Rockwell, of Chicago, has sold to the Cumberland Coal Co. one-half interest in two tracts of coal in Whiteley township, equal to about 49 acres; consideration, \$1. [The Cumberland Coal Co. is a subsidiary of the H. C. Frick Coke Co.—Editor.]

**Uniontown**—The Thompson tangle, dormant for several months, came to the front again here with the hearing upon a petition to dissolve the Thompson creditors' committee on the ground that it had long ago ceased to function. The hearing developed the fact that another deal is now pending for the sale of the involved estate and that negotiations have been well advanced. The negotiations with the unnamed purchaser are being conducted by J. V. Thompson, with assistance being given both by the trustees in bankruptcy and the members of the creditors' committee. The fact that a sale is now pending was introduced to show that the creditors' committee still is functioning.

**Connellsville**—W. J. Culleton and M. A. Buriss, superintendents of the H. C. Frick Coke Co., have exchanged plants. Mr. Culleton, who has been superintendent of the Phillips mine, has been transferred to Footedale and Ronco. Mr. Buriss, in charge of these mines, has gone to Phillips. Employees of each plant presented remembrances to their "super" upon his departure.

#### WEST VIRGINIA

**Caples**—The Central Pocahontas Coal Co. has recently completed negotiations for the purchase of the Standard Pocahontas Coal Co. The property includes a total of about 1900 acres of coal lands, with mine, dwellings, etc., having a capacity of about 10,000 tons per month. It is understood that the company is arranging plans for further development at an early date, to increase this amount to a total of 25,000 tons per month. Headquarters of the company are in the Payne Building, Welch, W. Va.

**Fayetteville**—Progress is being made by the East Gulf Coal Co. in the improvements being made at its plant at East Gulf, in the Stone Coal field, 30 new miners' dwellings being now under construction.

**Williamson**—After having been suspended for the greater part of the winter, operations will be resumed at practically every mine on Pond Creek, Mingo County, in the near future. This has been made possible through additional orders recently received.

**Glen Alum**—The Glen Alum Coal Co. will complete work in the near future on its No. 3 plant and will therefore be in position to mine and ship coal from that plant in a few weeks. The company has recently received orders which will insure full-time operations throughout the summer.

**Bluefield**—Summer improvements at the Coalwood plant of the George L. Carter Coal Co. will include the erection of a large steel tipple, an automatic hoist and a large number of company houses. Both at Coalwood and at Seaboard a number of men are now engaged in getting the mines in readiness for future activities. The shaft at the Coalwood plant reaches 19,000 acres of a 7-ft. seam of Pocahontas coal. The holdings of the Carter Coal Co. include 40,000 acres in West Virginia, Kentucky, Tennessee and Iowa.

#### KENTUCKY

**Whitesburg**—A number of operators in the Elkhorn fields have recently secured contract orders for shipment to the Lake trade, and feel much better concerning the prospects for summer business. It is reported that several of the operators see full-time operations ahead of them.

#### ALABAMA

**Birmingham**—A gas explosion in the Regal mine of the Majestic Coal Co. at Pinson, in the northern portion of Jefferson County, April 29, resulted in the death of 21 employees, included in the number being the master mechanic of the company. Seven other men were taken to a local hospital seriously injured, and further fatalities may result. Only a small number of the men were burned by the explosion, the majority of the deaths resulting from suffocation from the fumes. The physical damage was confined to the inside of the mine and operations will be resumed in the course of a week.

#### OHIO

**Wilber**—The Wayne Coal Co., of Pittsburgh, will soon start another stripping operation at this place. An additional 2000 acres of coal lands has been acquired and equipment is now being installed. It is expected to have the operation working by July 1.

**Crooksville**—The New York Coal Co. has opened up a 3500-acre block of coal ad-

joining the old workings of its mine near Rose Farm, and is arranging to operate the mine on a much larger scale than formerly. With the opening up of the lake trade, the output of the mine will reach 1500 tons per day.

#### INDIANA

**Brazil**—A tract of 118 acres of coal land three miles south of Harmony, belonging to Lewis McCollough, has been sold to E. Williams, of Paris, Ill., who will develop the coal under the land at some later period.

#### ILLINOIS

**Du Quoin**—The large plant of the Security Coal and Mining Co., of Missouri, owned by the Rutledge & Taylor Coal Co., Chicago, has resumed operations after a shutdown of two weeks. During this time a new railroad scale has been installed and general repairs made throughout the mine. The scale was put in by the Howe Scale Co. and was manufactured at Rutland, Vt. A much better outlook is reported for steady work at this mine in the near future.

**Tamaroa**—The Victory Collieries Co., at Tamaroa, north of Du Quoin, is installing a modern coal crusher which will increase the market value of its output. This mine was purchased two years ago by Dowell & Lafont, of Du Quoin, well known land dealers in southern Illinois, and reopened and then sold again to the present owners. Since its reopening it has increased in size and output 200 per cent.

**Harrisburg**—Reports coming from Saline County, mainly the mines surrounding Harrisburg and the O'Gara mines, say that mining conditions are almost at a standstill. In addition to the mines being idle, the Big Four R.R. has made slashing reductions in its yard forces and it is stated that many men have been laid off for as many as 60 to 90 days. No hope is held out for the mines to resume more steady work for at least three months.

**Carlinville**—The vast developments of the Standard Oil Co. are rapidly shaping into completion. One large mine has been completed and opened since last May. The other shaft at Shoper reached coal three months ago, and the machinery is fast being installed. The power plant which, it is said, can furnish enough power to run fifty mines, is almost finished. The railroad has been completed as far as Shoper. A big dam for a water reservoir is finished and the addition of 200 houses in Carlinville is about to be opened, with all houses completed.

**Belleville**—The St. Louis & O'Fallon Coal Co., after being fined \$25 and costs by a justice of the peace on each of three charges of violating the state mining law by failing to provide suitable washroom facilities at the so-called Nigger Hollow Mine No. 2, has announced that it will appeal to the Circuit Court. The charges were brought by State Mine Inspector Thomas Wright, and were substantiated by the testimony of miners.

**Edwardsville**—Work was begun recently on the steel tipple of the new Donk Bros. mine here, which is to have the largest shaft in southern Illinois.

**Alton**—The Moro Coal Co., failing to get the Big Four R.R. to move to its line, near Moro, will move its mine to the railroad. The company bought the old Kable mine more than a year ago and on the advice of experts sank the shaft at some distance from the railroad, in the expectation that the railroad company would build a spur to the mine. But the railroad company has declined to do so and the coal company has failed to induce private capital to build the spur, so another shaft is to be sunk right up close to the railroad. Work was begun on it a few days ago. John Kekich, of Alton, is head of the company. The company has about 1000 acres of coal.

#### TEXAS

**Rockdale**—Axford Hicks, of Tyler, Tex., has leased 1000 acres of land near Rockdale, in Milam County, Texas, and is sinking a number of test holes in an effort to locate lignite veins. It is his intention, if lignite is found in paying quantities, to open up a large mine.

#### MONTANA

**Havre**—A 7ft. coal seam has been uncovered on the Pat Yeen ranch here by well drillers, at a depth of 150 ft. The coal resembles the Lethbridge coal.

**Great Falls**—Deeds have been placed on record by which coal lands between Belt and Sand Coulee have been transferred to the Anaconda Copper Mining Co. for a consideration of \$158,000. It is understood the company purchased these lands with a view of making them into its chief coal

mines in northern Montana upon the exhaustion of its mines at Tracy, which is looked for within the next three years.

#### WASHINGTON

**Wenatchee**—The main shaft of the Wenatchee Orchard Land Co. coal mine near Appledale has penetrated to the coal seam, which has been found to be 10 ft. thick.

**Walla Walla**—While driving a well on the George W. Glouck farm near Atkins, at a depth of 490 ft., a large vein of lignite was uncovered, samples of which burned well under test.

**Spokane**—W. S. Rogers has been elected president of the Colville Valley Coal Co. A. N. Cantril, secretary and treasurer, and Joe Budersdorf, as manager, were reelected. Work is proceeding in the development of the company's mine near Colville, about 350 ft. of tunnel and 170 ft. of shafting being completed to date.

#### Foreign News

**Princeton, B. C.**—Railway construction men on strike here became troublesome toward the end of April and are charged with responsibility for a fire which broke out at the Princeton Coal and Land Co.'s plant. That the fire was incendiary in its origin is indicated by the fact that the hose, with which an effort was made to control the flames, was found to have been cut. While no definite particulars have been secured as yet, it is not believed that serious damage resulted. Detachments of the Royal Northwest Mounted Police have been dispatched to the scene and it is confidently expected that order will be restored in a short time.

**Victoria, B. C.**—Satisfactory progress is being made in the opening of the new No. 3 Mine of the Merritt Collieries, Ltd. Two slopes have been driven as well as two levels. Thomas Rowbottom is in charge of the work.

The Canadian Western Fuel Co. is continuing the development of the Wakesiah mine. This work was pressed forward for some months and then stopped. Its resumption is taken to indicate the company's intention to put the mine on a producing basis as soon as possible.

**Squash, V. I.**—The Pacific Coast Coal Mines, Ltd., has pumped the water out of its old mine at Squash, Vancouver Island. This property has been idle since the year 1914. With a ready market and good prices, it is likely that the company purposes making it productive without delay. This mine is situated in what is known as the Squash Coal Field of the Island, approximately 170 miles north of Nanaimo, B. C. Comparatively little active development has taken place in that section.

**Halifax, N. S.**—Representatives of the Nova Scotia Steel and Coal Co. and the Dominion Coal Co. are pressing their claims upon the Provincial Legislature with regard to enabling each company to obtain access to submarine coal deposits, hitherto inaccessible to the owner except through the property of its competitor. The companies having failed to get together and come to an understanding, as requested by the Provincial Government, it is announced that legislation will shortly be introduced to compel the companies to exchange coal areas on fair terms. While this would not affect the Dominion Coal Co. to any great extent, as it has ample reserves of unworked coal adjacent to its present workings, it would be most advantageous to the Nova Scotia Co. whose present workings are nearly exhausted and whose reserves would then be rendered accessible.

**Winnipeg, Man.**—Official records show that a total of nearly 600,000 tons of hard and soft coal came into Winnipeg between June 1 and Mar. 1, of which about 360,000 tons was shipped from the western mines. W. P. Brereton, city engineer, stated that "western coals have done splendid work at the city's high pressure plant, where most of the city's municipal purchases have been used." Archibald Blackie, city chemist, says that the analysis gave the best record for any soft coal the city has had, most of the samples examined for the city under guarantee orders showing the western coal to be higher in B.t.u. values than the standard required. The percentage of ash was also lower than required by the guarantee.

**Victoria, B. C.**—In placing coal mines in British Columbia under the income tax law for purposes of taxation, the Government has been guided by the recommendation of a taxation board, which was appointed two years ago for the purpose of investigating the present provincial methods of obtaining revenue and making any suggestions

considered wise for the removal of inequalities and the better distribution of the burden. The board's report, which was laid before the Provincial Legislature during its last session, gives considerable attention to the taxation of mining but, for the most part, its comments are directed to the situation in respect of metalliferous mining. Among its proposals, however, was that which was adopted—namely, the bringing of the collieries under either the 10c. per ton royalty or the income tax law, the Government to collect whichever method yielded the greater revenue.

#### Personals

**John L. Briton**, of McAlester, Okla., was elected vice president of District 21, United Mine Workers of America, in a special election recently held in the district.

**Major D. B. Wentz**, president of the Wentz Companies, has returned from France and is expected to visit the anthracite collieries of the company in the near future.

**J. B. Neale**, production manager during the war for the Fuel Administration, has been summoned by the President and will sail for Paris at an early date. No details of the import of his mission are available.

**I. D. Thomas**, of Hazleton, Penn., on Apr. 30 was appointed superintendent of the East Bear Ridge mines near Frackville, Schuylkill County. He was formerly manager of the Harleigh Brookwood Coal Co. at Harleigh.

**William Crooks**, who has been connected with the Tennessee Coal, Iron and Railroad Co., has assumed the position of superintendent of the Montevallo Mining Co. at Aldrich, Ala., taking the place left vacant by the recent resignation of **T. W. Lloyd**.

**H. B. Payne**, House Building, Pittsburgh, Penn., has been appointed district factory representative for bituminous fields of Pennsylvania and all of West Virginia by the Atlas Car and Manufacturing Co., of Cleveland, Ohio, handling the Atlas line of storage-battery locomotives.

**J. B. Crankshaw**, former manager of the Cranberry Creek and Alliance Coal Companies, accompanied by Mrs. Crankshaw, has sailed for his former home in London, England. Mr. Crankshaw will be associated with his father in an important English engineering company.

**Edwin Ludlow**, for the past ten years vice president of the Lehigh Coal and Navigation Co., has resigned, effective July 1. **W. G. Whildin**, a Lansford man, who has been a life-long employee, will succeed him. **J. P. Warriner** will continue as manager of the Cranberry Creek and Alliance Coal Companies.

**W. P. Engleman**, of New York City, has been retained as chief engineer of the Domestic Coke Corporation of Fairmont, W. Va. Mr. Engleman, during the war, was in the service of the Government as a coke and byproduct expert. He has resigned his Government position and has established his headquarters in Fairmont.

**F. J. Dawson** has been appointed assistant to the general manager of the Raleigh Coal and Coke Co., Huntington, W. Va., his appointment being effective May 10. Mr. Dawson has been general inspector and consulting engineer for all the smokeless fuel operations in the state. He is by profession a civil and mining engineer, his experience having taken him to England, Scotland, Wales, Mexico and Canada.

**Charles F. Colbert, Jr.**, of Brownsville, Penn., for the past eight years sales manager, and recently also assistant general manager of the W. Harry Brown coal and coke interests, and who since the sale of these properties to the Pittsburgh Steel Co. has been looking after the closing up of the transfer of the properties, has severed his connection with these properties and taken an interest in and the position of general manager of the Pioneer Coal and Coke Co., a recently organized brokerage concern with offices in the Henry W. Oliver Building, Pittsburgh, Penn. He will sell his property in Brownsville and move to Pittsburgh.

#### Obituary

**Robert Lake**, well known throughout Michigan, Ohio and Indiana as a coal merchant, having served as president of the Tri-state Coal Association, died in Jackson, Mich., on Apr. 29.

#### Coming Meetings

**American Wholesale Coal Association** will meet on June 3 at Cleveland, Ohio. Secretary, L. Romanski, Chicago, Ill.

**Illinois Mining Institute** will hold its annual meeting May 22, 23 and 24. Secretary, Martin Bolt, Springfield, Ill.

**National Coal Association** will meet May 21, 22 and 23, at Congress Hotel, Chicago, Ill. Secretary, J. D. A. Morrow, Washington, D. C.

**Illinois and Wisconsin Retail Coal Dealers' Association** will meet at Hotel Nelson, Rockford, Ill., June 4 and 5. Secretary, L. L. Runyan, Chicago, Ill.

**International Railway Fuel Association** will hold its annual meeting May 19-22 at the Hotel Sherman, Chicago, Ill. Secretary, J. G. Crawford, Chicago, Ill.

**Retail Coal Dealers' Association of Texas** will hold its annual meeting on May 19 and 20 at Fort Worth, Tex. Secretary, C. R. Goldman, Dallas, Tex.

**Central Pennsylvania Producers' Association** will hold its annual meeting May 15 at Chamber of Commerce Building, Altoona, Penn. Secretary, Charles O'Neill, Altoona, Penn.

**Southwestern Interstate Coal Operators' Association** will hold its annual meeting June 10 in the Keith and Perry Building, Kansas City, Mo. Secretary, C. N. Fish, Leavenworth, Kan.

**American Society of Civil Engineers** will hold its forty-ninth annual convention in St. Paul and Minneapolis, Minn., June 17 to 20. Secretary, C. W. Hunt, 33 West 39th St., New York City.

**Mine Inspectors' Institute of the United States of America** will hold its annual meeting July 8 to 11 at Indianapolis, Ind., subject to ratification of executive committee. Secretary, J. W. Paul, Pittsburgh, Penn.

**National Retail Coal Merchants' Association** will hold its annual convention at Buffalo, N. Y., May 14-16, with headquarters at Lafayette Hotel. Secretary-Manager, E. B. Gordon, 1727 Pennsylvania Ave., Washington, D. C.

**Kentucky Mining Institute** expects to hold its annual meeting this year on May 30 and 31 at Lexington, Ky. Secretary, C. W. Strickland, Huntington, W. Va.

**American Institute of Mining and Metallurgical Engineers** will hold its fall meeting Sept. 22 to 26 in Chicago, Ill. Chairman Chicago meeting, Carl Scholz, 517 West Jackson Boulevard, Chicago, Ill.

**American Society of Mechanical Engineers** will hold its spring meeting at the Hotel Statler, Detroit, Mich., June 16 to 19. Secretary, Calvin W. Rice, 29 West 39th Street, New York City.

#### Recent Coal and Coke Patents

**Mine Car.** M. S. Runsvold, Bisbee, Ariz. 1,276,418. Aug. 20, 1918. Filed Sept. 7, 1917. Serial No. 190,211.

**Coal-Mining Machine.** J. Grigar, Lowell, Ariz. 1,278,333. Sept. 10, 1918. Filed Jan. 25, 1917. Serial No. 144,518.

**Smoke Consumer.** A. Habig, Montreal, Quebec, Can. 1,278,639. Sept. 10, 1918. Filed Oct. 26, 1915. Serial No. 58,007.

**Safety Device for Mine Cars.** L. Pichler, Fort Wayne, Ind. 1,278,742. Sept. 10, 1918. Filed Jan. 10, 1918. Serial No. 211,207.

**Boiler Furnace.** A. C. Mott, Jr., assignor to A. Cox Stove Co., Philadelphia, Penn. 1,276,395. Aug. 20, 1918. Filed Sept. 8, 1917. Serial No. 190,341.

**Mining Apparatus.** C. J. E. Waxbom, assignor to Jeffrey Manufacturing Co., Columbus, Ohio. 1,276,141. Aug. 20, 1918. Filed Oct. 11, 1912. Serial No. 725,323.

**Process of Treating Coal.** C. H. Smith, assignor to International Coal Products Corporation, Richmond, Va. 1,276,428. Aug. 20, 1918. Filed Jan. 31, 1916. Serial No. 75,288.

**Safety Gate for Mine Shaft.** W. H. Finley, assignor to Fairmont Mining Machine Co., Fairmont, W. Va. 1,276,199. Aug. 20, 1918. Filed Feb. 19, 1918. Serial No. 218,054.

**Furnace Structure.** R. M. Spencer, assignor to Columbus Heating and Ventilating Co., Columbus, Ohio. 1,278,777. Sept.

10, 1918. Filed Jan. 23, 1913. Serial No. 743,721.

**Steam Boiler.** J. Harter, Jr., assignor to Babcock & Wilcox Co., Bayonne, N. J. 1,280,996. Oct. 8, 1918. Filed Oct. 13, 1915. Serial No. 55,625.

## Publications Received

**The Nenana Coal Field, Alaska.** By C. C. Martin. Department of the Interior, Bureau of Mines. Bulletin 664. Illustrated, 55 pp.; 6 x 9 inches.

**Illinois Mining Statutes Annotated.** By J. W. Thompson. Bulletin 169, Law Serial 15. Department of the Interior, Bureau of Mines. Unillustrated, 594 pp.; 5 1/2 x 9 1/2 inches.

**Notes on Lignite—Its Characteristics and Utilization.** By S. M. Darling. Technical Paper 178. Department of the Interior, Bureau of Mines. Unillustrated; pp. 19; 5 1/2 x 9 1/2 inches.

**Statistics of Mines and Quarries in Ohio, 1917.** Bulletin of the Industrial Commission of Ohio, Vol. V, No. 2. Department of Investigation and Statistics. Report No. 36. Unillustrated, pp. 98. 6 1/2 x 9 1/2 inches.

**Monthly Statement of Coal Mine Fatalities in the United States, November, 1918.** Compiled by Albert H. Fay. Department of the Interior, Bureau of Mines. Unillustrated, 31 pp.; 6 x 9 inches.

**Quarry Accidents in the United States During the Calendar Year 1917.** Compiled by Albert H. Fay. Technical Paper 213. Department of the Interior, Bureau of Mines. Unillustrated; pp. 62; 5 1/2 x 9 1/2 inches.

**Abstracts of Current Decisions on Mines and Mining, Reported from January to May, 1918.** By J. W. Thompson. Bulletin 172. Law Serial 16. Department of the Interior, Bureau of Mines. Unillustrated; 160 pp.; 6 x 9 inches.

**Coal-Mine Fatalities in the United States, 1918, and Coal-Mine Statistics Supplementing Those Published in Bulletin 115.** Compiled by Albert H. Fay. Department of the Interior, Bureau of Mines. Unillustrated, pp. 61; 5 1/2 x 9 1/2 inches.

**Annual Report of the Superintendent, United States Coast and Geodetic Survey, to the Secretary of Commerce for the Fiscal Year Ended June 30, 1918.** Department of Commerce, United States of America. Illustrated, 133 pp.+index; 6 x 9 1/2 inches.

**General Orders, Regulations and Rulings of the United States Fuel Administration.** Compiled by the Legal Division of the Administration. Including the acts of Congress, executive orders and proclamations of the President pursuant to which the United States Fuel Administration was created and is acting. Unillustrated, 614 pp. and index. 5 1/2 x 9 1/2 inches.

## Trade Catalogs

**New Book of E. M. Synchronous Motors.** Electric Machinery Co., Minneapolis, Minn. Bulletin 501. Pp. 42; 8 1/2 x 11 in.; illustrated. Describes briefly and simply the construction, characteristics and the applications of the synchronous motor.

**The Nixon Ratchet Mining Drill.** The Bonney-Shanks Co., Chattanooga, Tenn. Catalog. Pp. 8; 6 x 9 in.; illustrated. Describes in detail the manufacture and operation of a practical ratchet drill for driving entries and airways, taking top and bottom, and mining hard coal.

**Fifty Years of a Successful Industry.** The Vale & Towne Manufacturing Co. Souvenir Booklet. Pp. 76; 5 1/2 x 8 in.; illustrated. Commemorative of the completion of 50 years of activity by the corporation. Is of interest as illustrative of the origin and development of one of the well-known American industries.

**"Over 1000 Scoop Conveyors."** Portable Machinery Co., Passaic, N. J. Folder Pp. 20; 6x9 in.; illustrated. Shows the various uses of the scoop conveyor and describes clearly the labor, time and money-saving features of the machine in storing, reclaiming, loading and unloading loose materials.

**Reducing Ash-Disposal Costs.** American Steam Conveyor Corporation, Chicago, Ill. Booklet. Pp. 12; 8 1/2 x 11 in.; illustrated. Of interest to engineers and power plant executives will be the diagram and description of an ash conveyor that paid for itself

in eighteen months. Diagrams and photographs of actual installations are used to liven the booklet.

**Lidgerwood Coal-Handling Cableways.** Lidgerwood Manufacturing Co., New York, N. Y. Bulletin 34. Pp. 10, 9 x 12 in., illustrated. Covers a cableway for coal-storage purposes. It is claimed that with the aid of the device described and illustrated in the bulletin, coal can be successfully stored where the ground available could hardly be utilized with any other method.

the company. It also owns two or three coal mines.

**Baltimore, Md.**—The Black & Decker Manufacturing Co., builders of portable electric tools, electric air compressors and special machinery, has established a New York office at Room 2920, Equitable Building. The office will be in charge of G. R. Lundane, who will supervise the distribution of the company's products in New York city and surrounding territory, including the State of Connecticut.

**Buffalo, N. Y.**—The Copper Coal Co., of Brockwayville, Penn., has been incorporated in this state under the same name, with W. C. Quinn, president of the parent company, and George B. Burd and A. C. Hynd, of Buffalo, incorporators. Capital stock is \$200,000. The idea is to sell the coal, which comes from the Argentine mine in Butler Co., Penn., through this market and possibly open an office here.

**Frankfort, Ky.**—The State Railroad Commission has been advised of the completion of the 10-mile coal-carrying railroad of the Black Mountain R.R. from Huline, Bell County, Kentucky, to the Louisville & Nashville junction in Harlan County. Offices are in Pineville, and the line will be placed in operation as soon as necessary equipment arrives. This will open up shipping for several new mines.

**Toledo, Ohio.**—D. H. Goodwillie, service director, will receive bids until June 3 for installing coal-handling equipment consisting of (a) one track hopper coal crusher and elevator and conveying machinery, (b) one suspended steel coal bunker with supports, (c) one traveling weigh hopper, all to be erected complete at the Broadway Pumping Station, H. C. McClure, Valentine Building, Toledo, Ohio, City Engineer.

**Cincinnati, Ohio.**—The City of Covington, across the river from Cincinnati, has passed an ordinance that will eliminate the temporary coal merchant. The ordinance provides a license of \$500 for a temporary merchant. The coal men claim this will be an equal protection for other merchants as well as themselves. The new ordinance will make it unprofitable for the individual dealer to enter the coal business for a few months during the winter season.

**Fairmont, W. Va.**—Directors of the Consolidation Coal Co., at a meeting in Baltimore recently, elected Frank R. Lyon, of Fairmont, a vice president and placed him in charge of all operations of the company. Brooks Fleming, Jr., of Fairmont, was made assistant to the president and will likely be Mr. Lyon's assistant in the company's operations, which embraces numerous mines in the States of Maryland, West Virginia, Kentucky and Pennsylvania. For six years Mr. Lyons has been general manager of the company.

**Seattle, Wash.**—To investigate terminal facilities and improvements in transportation necessary to handle the output of the navy coal lands at Cook Inlet, Alaska, Captain Sumner, E. W. Kittelle and Capt. L. E. Gregory, U. S. N. are on their way to join a party of scientists in Alaska who will handle a part of the investigation work. The navy is planning to bring Alaska coal into use, and the facilities needed at the Matanuska fields, which will be investigated, and the expense of installing transportation and terminal works, will be covered in the report to be submitted to guide the making of appropriations for the purpose. The party will be absent about six weeks and will work from Anchorage as a base.

**Jefferson City, Mo.**—Missouri now has a workmen's compensation law. The bill as amended and passed by the Senate was passed by the House Thursday, May 1, by a vote of 125 to 4. It is to be administered by a bi-partisan commission of four, one member of which shall represent the employers and one the employees. The commissioners will be paid \$4000 a year each. The bill becomes effective Nov. 1. It provides for medical aid for the first eight weeks at a cost of not to exceed \$200. Compensation is to be on the basis of 66 2/3 per cent. of wages, computed on the annual average, the maximum to be \$15 per week and the minimum \$6 per week. Temporary total disability is not to exceed 400 weeks. For temporary partial disability the provision is two-thirds of the wage loss, not exceeding 200 weeks. For permanent total disability the compensation is to be two-thirds wages for 240 weeks and thereafter 40 per cent. of wages for life. The burial benefit is \$100 in every case and total dependents are to receive two-thirds of wages for 300 weeks. All insurance for employees is to be procured from private companies. Employers and employees may elect whether to come under the law's provisions.

## Industrial News

**Pittsburgh, Penn.**—Gellatly & Co. and the Ohio Brass Co. announce that they are now located in Suite 2205-6 Oliver Building.

**Indianapolis, Ind.**—Dean Bros. Steam Pump Works have opened a New York City office at 141 Broadway. H. Meachem has been appointed district sales manager.

**Whitesburg, Ky.**—The Caudill Coal Co., at Caudill, Ky., has changed its name to the Solon Coal Co. Williamsburg and Whitley City interests control the company.

**Chicago, Ill.**—On May 1 the local office of the Ohio Brass Co., of Mansfield, Ohio, was moved from 508 Fisher Building to 1217 Fisher Building, 343 South Dearborn St. The telephone number has been changed to Harrison 4343.

**Hartford, Conn.**—The Terry Steam Turbine Co. announces the appointment of R. L. Thomsen as sales manager. Previous to his appointment, Mr. Thomsen was manager of the Marine Department for the Griscom-Russell Co.

**Cincinnati, Ohio.**—The Pocahontas Coal Sales Co. and the Glen Alum Fuel Co. announce that they have removed their western office, in charge of John R. Miller, from 1405 to 1207 Fisher Building. The telephone number is Harrison 5414.

**New York, N. Y.**—Greene, Tweed & Co., 109 Duane St., manufacturers of Palmetto and other packings, have issued a new catalog which in effect is a guide book to the use of packings. It contains much of value to those who use and buy packings, and will be sent free of charge upon request.

**Hazard, Ky.**—It is reported that the Thornton Creek branch of the Louisville & Nashville R.R. will be extended into the Headwaters division of the section, tapping additional coal and timber districts which have been waiting on rail connections.

**Cleveland, Ohio.**—Drusus H. Nichols and John C. Moore, formerly managing director and assistant director of the Allied Publicity Bureau, announce the organization of the Nichols-Moore Co., general advertising agents, to be located at 11705 Detroit Ave., Cleveland.

**Wilmington, N. C.**—The Cement Products Co., manufacturer of the "Sanisept" sewerage disposal systems, with main offices at Wilmington, N. C., has opened a branch sales office at 39 Cortlandt St., New York, which is in charge of J. F. Harris, vice president of the company.

**Pittsburgh, Penn.**—The Pittsburgh Mining Machinery Co., with offices in the First National Bank Building, has recently completed extensive improvements at its factory for rebuilding and repairing mining machines, locomotives, motors, etc. The new shops are at Magnolia and Cantral Sts., North Side.

**Jersey City, N. J.**—The Joseph Dixon Crucible Co., manufacturers of silica-graphite paint, crucibles, graphite greases and graphite lubricants, have announced the removal of their Philadelphia sales office from 1020 Arch St. to Rooms 801 and 802 of the Finance Building, South Penn Square, Philadelphia, Penn.

**Charleston, W. Va.**—The Malleable Coal Co. is understood to be arranging plans for the construction of a large coal tipple at its coal-mining properties, and the building of two additional miles of railroad line. It is said that the company is planning for the development of new coal-mining properties in addition to its present works. Samuel Butler is manager.

**Indianapolis, Ind.**—It is reported that the Neal Gravel Co., Indianapolis, Ind., plans to double the capacity of its plant at Attica, which will necessitate the purchase of engines, boilers, crushers, screeners and gravel-removing equipment, possibly a new steam shovel. This is to be the largest plant of the four owned and operated by

## MARKET DEPARTMENT

EDITED BY ALEX MOSS

### *Weekly Review*

#### *Anthracite Industry Busy, While Bituminous Market Is Still Stagnant—Better Conditions In Soft Coal Looked for Soon—Some Price Cutting Reported—Scarcity of Egg Coal*

IT IS interesting to note the contrast presented by the anthracite and bituminous branches of the coal industry at the present time. In the hard-coal regions activity is everywhere in evidence, while in the sections where bituminous coal is mined many operations are barely working. The reason for this difference will readily be appreciated when it is understood that anthracite coal is used principally by domestic consumers, while bituminous coal is consumed by the industries. Of the 90 million tons of anthracite produced yearly, probably 70 million tons is burned for domestic purposes; the domestic consumption of bituminous coal, on the other hand—70 million tons—is negligible when compared to the large annual output.

However, better days are coming for the soft-coal operators, as increased activity is discernible in industry in general. Once the Victory Loan is successfully closed and out of the way, and the political turmoil in Europe quiets down, plants the country over can begin to extend their operations and count on the necessary banking assistance to enable them to do so. When the present uncertainties beset shipping, price regulation and pub-

lic utilities are removed, it will mean a renewal of prosperity; and a renewal of prosperity means an augmented demand for fuel. The two are inseparable.

Still, it must be recorded with regret that though an improvement is observed in soft-coal conditions from week to week, the change is barely perceptible. There is quiet buying here and there, but the tonnages are not large enough to exert any material effect on prices. There is plenty of spot coal available, and thus steam-coal users see no necessity at this time for haste in the closing of contracts for their future requirements. Railroad buying, in the main, is still shrouded in mystery, though it has been made public that the Pennsylvania lines east of Pittsburgh have contracted for a large tonnage of run-of-mine at the former Government price.

In the anxiety to dispose of coal, some of the Middle West operators are reported to have released their output at comparatively low prices, and the same has been said of operators in the Eastern fields. This tendency to recede from the announced intention of curtailing production rather than selling coal at a loss is not true of the industry

as a unit. In fact, prices are being adhered to firmly, and the output of only 7,362,000 net tons of bituminous coal during the week ended April 26 is proof conclusive that the rate of production is still far behind the rate of consumption.

If plans of the Government materialize, much of the stagnation in the bituminous coal industry will be eliminated by the export of a large volume of coal. The necessary ships have been promised by July, and the soft-coal operators, through the National Coal Association, have signified their willingness to coöperate in every way possible.

So great has been the demand for the domestic sizes of anthracite that already the mines are unable to ship the necessary tonnages. The call from consumers for prompt delivery of coal that will not be burned until next fall is reflected in a growing shortage of egg coal. Many of the mines have sufficient orders on their books to carry them through the month of July, and even the steam sizes of anthracite are being called for in increasing volume. The prices of these coals have tightened considerably. During the week ended April 26 the anthracite mines produced 1,401,000 net tons of hard coal.

#### WEEKLY COAL PRODUCTION

Bituminous coal production during the week ended Apr. 26 is estimated at 7,362,000 net tons, and is a slight falling off compared with the output of the week of Apr. 19, estimated at 7,413,000 net tons. During the same week of 1918 the operators of the country produced 11,720,000 net tons. The daily average per working day during the current week is estimated at 1,227,000 net tons, as against 1,235,000 net tons during the week preceding and 1,358,000 net tons for the calendar year to date. For the period of Jan. 1 to Apr. 26, 1919, the production of bituminous coal is estimated at 135,759,000 net tons, and falls 42,313,000 net tons, or 24 per cent., below the output of the same period of 1918, estimated at 178,072,000 net tons.

The production of anthracite in the United States during the week ended Apr. 26 is estimated at 1,401,000 net tons, as compared with 1,568,000 net tons for the week ended Apr. 19, and 1,870,000 net tons during the corresponding week of last year. The daily average per working day during the week ended Apr. 26 is estimated at 234,000 net tons, as compared with 237,000 net tons, the daily average for the calendar year to date and 312,000 net tons, the daily average for the same period of 1918. For the calendar year to date, production of anthracite is estimated at 23,662,000 net tons for the corresponding period of 1918.

Shipments of bituminous coal from the tidewater harbors to all points during the week ended Apr. 26 are estimated at 453,074 net tons, as compared with 405,117 net tons during the week preceding, and 873,630 net tons during the same week of last year. During the current week improve-

ment occurred at all harbors with the exception of Philadelphia. The New England shipments of bituminous coal by tidewater during the week of Apr. 26 amounted to 102,789 net tons, as compared with 79,491 net tons during the week preceding. Tonnage was loaded at Baltimore for the first time since the week ended Mar. 29 and amounted to 3478 net tons.

Beehive coke production in the United States during the week ended Apr. 26 is estimated at 261,767 net tons, as compared with 294,848 net tons during the week ended Apr. 19, and 655,698 net tons during the week of Apr. 27, 1918. The current week's production, the lowest recorded in recent years, shows, when compared with the preceding year's production, the tremendous pressure which was brought to bear at that time to make available the amount of coke which was necessary for war purposes. During the current week, production fell off in all states, with the exception of those west of the Mississippi. Pennsylvania production continues on the downward grade, and is today but 40 per cent. of that recorded during the week of Apr. 27, 1918.

With the opening of the lake season, bituminous coal figures on dumpings at the lower lake ports are once more available, and beginning with this issue, will be a regular feature of the weekly report. During the week ended Apr. 19 the tonnage loaded amounted to 288,524 net tons, and was approximately 50 per cent in excess of the tonnage loaded during the same week of last year. For the season to date, the tonnage loaded amounted to 561,235 net tons, as compared with 288,186 net tons during the same period of 1918.

#### Atlantic Seaboard

##### BOSTON

A dull featureless market. Apparently no decision yet on railroad requirements for this territory. Operators in need of May and June orders and concessions made to get them. No change in outlook for contracts. Hampton Roads factors still struggle with only hand-to-mouth business available. Slight improvement noticed inland. Margin between spot prices and those for deferred delivery, especially where rehandling is involved. Anthracite shipments slowing up. Egg in short supply. Coal for New England railroads likely to be factor in slow movement of domestic sizes. Retail prices advanced in Boston.

**Bituminous**—The market drags along with no significant change. There is quiet buying here and there, but the tonnages are not large enough to have any effect on prices. Buyers are aware that spot business is what is particularly desired by the shippers, while all-rail or at tidewater, and many of them are temporizing by arranging only for May or June delivery, leaving until later in the season their decision as to making contracts. There has seemed no inducement thus far to close such contracts on the quotations available, except in the case of certain specialties. Steam-users who have the run of the market and can buy from a range of coals see no reason for haste in closing for their requirements.

It was supposed that by May certain doubtful features would be settled, but railroad fuel and season rates of freight on

barques and steamers from Hampton Roads are both undetermined, except in a limited sense.

Instead of the long-awaited spurt in demand it develops that operators are much in need of orders for May and June delivery. This is particularly true of those producers whose coals are less favorably regarded, although there is distinctly a strong selling effort in behalf of the highest grades from the Somerset and Cambria districts. In most cases concessions of 10c. @ 25c. have been made to secure spot business, and it is this sign of weakness that gives buyers the impression there is plenty of time for securing next season's supply.

As to contract quotations, there is no apparent change. Practically no concessions are reported, for as yet neither shipper nor consumer seems able as yet to sense what the situation will be next fall and winter.

The Pocahontas and New River shippers still have hard going in New England. Seldom are there any sales reported. One of the street-railway systems is receiving bids this present week, and on that portion of the tonnage to be taken at plants directly on tidewater there is much interest to see the result. Only scattering business seems to be available for the Hampton Roads shippers and their tonnage is extremely light for this market. Most of the business that could be closed easily was underwritten early in the season before the \$2.75 per net ton f.o.b. mine basis went into effect, and on the latter figure only the most loyal of customers have been induced to make season arrangements. For the bulk of their tonnage inland the Hampton Roads distributors are obliged to rely upon quality and years of service to offset the heavy differential in favor of the all-rail coals, and it is a notable fact that there is now observed some improvement in the demand from this source.

There is still a pronounced margin between present prices for spot shipment on the Southern coals and quotations for extended delivery. For the latter \$7.90 is the current figure per gross ton on cars Boston, while May deliveries have been offered rather freely on the basis of \$7.20 @ 7.35. There are still a number of West Virginia shippers who are offering standard Pocahontas and New River at \$2.35 per net ton at the mines. Accumulations are the order of the day at the Virginia terminals, and with the exception of low grades from Pennsylvania there is today no class of coals on which the market is so druggy as the high-grade smokeless varieties from the Pocahontas and New River districts.

Bituminous prices current at wholesale are about as follows, f.o.b. mines and at loading ports, per gross or net tons as designated:

Cambrias		
Clearfields and Somersets		
F.o.b. mines, net tons... \$2.15@ \$2.75	\$2.80@ \$3.25	
Philadelphia, gross tons... 4.20@ 4.90	5.00@ 5.30	
New York, gross tons... 4.50@ 5.25	5.35@ 5.70	
Alongside Boston (water coal), gross tons.....	6.10@ 6.85	6.90@ 7.55

Georges Creek is quoted at \$3.20 f.o.b. mines per net ton.

Pocahontas and New River are unchanged at \$4.69 @ 5.14 f.o.b. Norfolk and Newport News, Va., per gross ton, according to the shipper, for spot or contract. F.o.b. Boston the present gross ton range would be \$7.20 @ 7.65. It is understood that factors are still offering contracts on cars Boston for inland delivery at \$7.90 per gross ton.

**Anthracite**—Since the last week in April shipments of domestic sizes have slowed up materially. Retailers who have stirred up the public to put in coal now find themselves unable to get cargoes forward in sufficient volume. All-rail there has also been a noticeable slackening in the tonnage of domestic sizes. The demand from the public for prompt deliveries now of coal that will not be used until next fall is reflected in the shortage of egg at most of the loading ports.

One of the ominous features of the current situation is the large tonnage, which it is understood the Railroad Administration has ordered carried in Philadelphia & Reading barges to supply fuel for New England railroads at Portland, Maine, and points east. If carried through this will seriously curtail the space available to move domestic sizes in transportation that is normally the largest single channel of supply for tidewater New England. And this is done at a time when eighty or ninety steamers of the emergency fleet type are lying idle with no authority being exercised to put them into service. Something is wrong somewhere, and unless steps are

taken to correct this particular situation there will be another anxious for the anthracite-consuming public.

On May 1 the Boston retail dealers advanced the price of broken, egg, stove and chestnut from \$11, sidewalk delivery, to \$11.50. Part of this advance is due to the situation at wholesale, but most of the 50c. increase is due to the recent wage agreement with teamsters and chauffeurs.

#### NEW YORK

**Anthracite demand active, with some operators sold six weeks ahead. All sizes, particularly stove and egg, wanted. Canada sends many orders while the West is looking for quick shipments. The bituminous market slows down with prices showing a slight falling off. Buyers look for cheaper coals and hesitate to make purchases.**

**Anthracite**—The long expected activity in the anthracite market is here, and both producers and dealers find themselves well supplied with orders. Many of the former, especially the so-called Independents, have orders sufficient to keep their operations going at full speed for several weeks to come. It was said in some quarters that some of the smaller operations have plenty of orders for domestic coals to keep them busy until the early part of July; in fact, it was said that some had sent word to dealers handling their product not to accept any more orders at present.

The larger companies are also crowded with orders and their operations are kept humming, most of the mines being reported as working nearly full time.

The trade expects an unusually busy summer as most cellars are far short of next winter's fuel supply, the consumers having delayed placing their orders in the expectation of a reduction instead of an advance in the price.

There is a heavy and an increasing call from Canada and the West, and coupled with it is a cry for quicker shipments. Consumers in Canada and the West are just as anxious to fill their bins as are the consumers here.

So far as the local market goes the heavier call is for stove and egg, but the other sizes do not lag far behind. Salesmen, however, have no difficulty in moving any of the other sizes, since dealers are willing to take any size in order to get what they want in the larger coals. Along the line the trade is active. Demand is heavy and the dealers are filling their bins.

Pea coal does not move so quickly as the larger sizes, but there is no anxiety regarding it. Whatever uneasiness existed last week regarding quotations has about disappeared, and reports of any slight concessions being made now are few and far between.

The steam coal situation has tightened considerably. Demand is good and there is comparatively little surplus coal to be seen at Tidewater. Quotations are firm, but slight concessions were heard on certain grades of buckwheat and barley.

Retail dealers report considerable activity. Consumers are now anxious to get their winter supply in before the summer vacations begin and are urging deliveries. Current quotations, white ash, per gross ton, at the mine and f.o.b. tidewater at the lower ports, are as follows:

	Mine	Company Circular
Broken.....	\$6.05	\$7.90
Egg.....	5.95	7.80
Stove.....	6.20	8.05
Chestnut.....	6.30	8.15
Pea.....	4.90	6.65
Buckwheat.....	3.40	5.15
Rice.....	2.75	4.50
Barley.....	2.25	4.00

**Bituminous**—Conditions in the bituminous market are quiet and are reflected in quotations for the various grades of coal, which in the majority of cases show a decline from last week. Business is dull here and shippers, do what they will, are unable to convince buyers that the present is the time to buy.

Many buyers continue to cling to the opinion that they will be able to get coal at lower prices rather than pay higher prices next fall, and for that reason are holding back their orders. However, there are many who believe the turning point in the situation is not far distant. With it may come a complete reversal in present market conditions and a hustle to get coal. The mines are working scarcely better than half time, and the workers are not taking kindly to this program.

In this harbor the movement of coal since the end of the harbor strike has been a

disappointment. It was expected that consumers would want to replenish their stocks and buying would continue to be heavy for several weeks to come. Many buyers after partly filling their bins curtailed their deliveries with the result that boat movement is slow and some shippers have had difficulty in getting rid of loaded boats unless they make concessions.

During the past week there has been a falling off in buying for commercial purposes, but bunker demand has remained brisk. Contract coals are moving rapidly, which enables shippers to keep their stocks at the docks down to a minimum.

While there has been a slight change in current quotations for spot coal for the various grades, shippers have not been forced to dispose of their stocks at low figures. As usual much depends upon supply and demand.

There have been many inquiries for coal for export, but no actual closings of contracts have been reported.

Dumpings of bituminous coal here for the week ended May 3 were 5955 cars, as compared with 5420 cars the previous week. During April there were 20,708 cars dumped as compared with 11,516 cars in March, 23,663 cars in February and 23,769 cars in January.

Current quotations for the various grades of bituminous, for spot shipment and on contract, follow:

	Spot	Contract
South Forks.....	\$2.90 to \$3.25	\$2.95 to \$3.50
Cambria County (good grades)....	2.75 to 2.95	2.95 to 3.25
Clearfield County (good grades)....	2.50 to 2.75	2.80 to 2.95
Reynoldsville.....	2.50 to 2.75	2.75 to 2.95
Quemahoning.....	2.65 to 2.85	2.95 to 3.10
Somerset County (best grades)....	2.65 to 2.85	2.95 to 3.10
Somerset County (poorer grades)....	2.00 to 2.35	2.50 to 2.75
Western Maryland.....	2.25 to 2.75	2.50 to 2.75
Fairmont.....	2.00 to 2.25	2.35 to 2.50
Latrobe.....	2.10 to 2.25	2.25 to 2.40
Greensburg.....	2.25 to 2.35	2.35 to 2.60
Westmoreland Co. Inc. ....	2.60 to 2.75	2.60 to 2.75
Westmoreland run-of-mine.....	2.35 to 2.60	2.35 to 2.65

#### PHILADELPHIA

**Strong demand for family sizes of anthracite. Business booked long time in advance. Heavy call for egg, making loss of broken tonnage less important. Pea improves. Price cutters increase their rates. Stove orders impossible to fill. Successful advertising campaign. Steam sizes show slight improvement. Bituminous dull and without feature. Little spot coal.**

**Anthracite**—There is an intense demand for all the domestic sizes. All companies are jammed with orders, and those concerns who are willing to accept business for weeks ahead report heavy tonnages for shipment right up to July. The shippers are surprised at the amount of business for egg being received from the local trade. Except in the suburbs, the Philadelphia dealers formerly ordered a small tonnage of this size; but now the orders are out of all proportion to the production. This is particularly gratifying to the operators, for they have lost quite a lot of strictly commercial tonnage due to the turning of many gas companies to coke, which can now be purchased at a much lower relative price.

Stove size is in a hopeless state so far as the producers are able to fill orders for it. Every dealer is insistently calling for this size. At the offices of the larger shippers it is reported that sufficient orders for stove have been received in the last week or two to absorb the entire production for several months. Many yards are entirely bare of it, and no promises are being made as to when they can be stocked. Chestnut, too, is active, but a greater tonnage of this size seems to be coming here. Pea continues to be the size in least demand, but the improvement in this size has been so noticeable that promises of immediate shipment are no longer being made. The companies who had been compelled to send some of this size to storage yards are now able to send their full production directly into the market.

As anticipated, several of the price cutters who have always made pea coal their special point of attack have advanced their rates on this as well as the other sizes. The lowest figure at which pea coal can now be purchased at retail is \$8.50, which is 50c. less than the dealers generally are charging.

The steam trade is slow to respond and appears to be something of a puzzle to all anthracite men. The big companies continue to stock while the smaller operators who are compelled to move their coal are

cutting prices and hoping for changed conditions. They report that some of their trade has gone over to bituminous; others over-bought and are now consuming their surplus stock. Yet it can be said there is actually some improvement in the steam sizes. Buckwheat is in much better demand and good improvement has been shown in the demand for rice. Barley is still hopeless, and no one really expects that it will improve for many weeks or even months.

No one can be found who is willing to venture a decided opinion on buckwheat, but it is apparent to some that the \$3.40 price is hurting it. Some of the largest contracts carrying that price are still in the hands of consumers unsigned. In the meantime sales are reported around \$2.85, with small lots at \$3. As heretofore, rice is stronger than buckwheat, but is being offered at from \$2.50 to \$2.60. For barley a fair price is \$1.50, and shippers are glad to get it.

The prices per gross ton for line shipment and f.o.b. Port Richmond for tide are as follows:

	Line Tide	Line Tide
Broken.....	\$5.95	\$7.80
Egg.....	5.95	7.80
Stove.....	6.20	8.05
Nut.....	6.30	8.15
Pea.....	4.90	6.50
Buckwheat.....	\$3.40	\$4.45
Rice.....	2.75	3.65
Boiler.....	2.50	3.50
Barley.....	2.25	3.15

**Bituminous**—The trade continues quiet with practically no improvement during the last six weeks or more. Despite this colorless state of affairs shippers remain fairly optimistic that the turn in the road will soon be in sight. As it now stands, no one is willing to produce any more coal than is absolutely necessary to fill orders in hand. Most of the production continues to be apied on contracts, and even such agreements as have been signed are not taking the full amount. Under such limited production there is of course little spot market.

All houses continue to receive numerous inquiries for prices on contracts, many being from the same consumers who have been asking figures for weeks past. They are simply sounding the market. While all shippers of consequence have received the proposition of the railroad authorities to supply fuel on the basis of a \$2.40 to \$2.50 price, it is not thought it has been accepted by many. The following are the prices which have ruled lately:

Georges Creek Big Vein.....	\$2.90 @ \$3.00
South Fork Miller Vein.....	2.90 @ 3.00
Clearfield (ordinary).....	2.75 @ 2.90
Somerset (ordinary).....	2.55 @ 2.71
Fairmont lump (ordinary).....	2.40 @ 2.50
Fairmont mine-run.....	2.15 @ 2.25
Fairmont slack.....	1.90 @ 2.00

#### BALTIMORE

Increased activity in contracts follows some cutting on particular grades of bituminous. Wide range of quotations on both contract and spot coals of like quality. Hard-coal men here continue busy with deliveries. Exports look healthy.

**Bituminous**—There are undoubtedly signs of increasing activity in the contract market. For some weeks the trade heard of a number of inquiries on contracts, but few closings of importance were noted following the quotations of prices that held pretty well to the old Government maximum figures, even on the less desirable fuels. Now, however, quite a few consumers who want specialized coal have stopped purchasing in the open market, even at an advantage, and are closing at or near the old maximum. In addition there has been some decided cutting in contract quotations on fair to good coals in many instances, and this has stimulated buying.

Even on contracts on similar grades of coal, however, there is at times a considerable latitude of prices, and on some pretty good coals offerings were noted all the way from a mine basis of \$2.50 to \$2.95 to the trade. The spot market was spotty the past week, sales of best coals at tide being noted in a range of from \$2.40 to \$2.95 mine basis to the trade, of good coals not of special grading at from \$2.20 to \$2.80, and on less desirable coals at from \$2.10 to \$2.50, showing at times, an overlap of prices on coals of decidedly different quality.

The export movement continues encouraging, and inquiries and orders are such that only the lack of bottoms prevents a considerable spurt in the movement. For the week ending Apr. 26 the Custom House reports total loadings on foreign account of 19,690 tons, including 1456 tons used by the carriers for bunker purposes.

**Anthracite**—The hard-coal dealers here continue busy making deliveries for May

at the low price schedule of the year, the April cut having been maintained by the retailers for the month of May, at least. Some of the dealers are still delivering on orders placed the first half of April, not having received all the coal they ordered from mine connections. Wherever possible the trade is delivering promptly in order to keep yard forces moving at maximum and to get as much coal as possible from the mine connections. Chestnut still remains rather scarce here. Pea coal is the most liberal in supply.

#### Lake Markets

##### PITTSBURGH

**Pennsylvania R. R. pays full price. Trade much encouraged. Contracts beyond Sept. 1 not popular. Production at about 50 per cent.**

The Pennsylvania R.R. lines, east of Pittsburgh, has closed a contract with the Pittsburgh Coal Co. for 1200 tons of coal daily to the end of the coal year, at \$2.35 for mine-run, the former Government price. The news came as a surprise to some in the trade, although not to those who have been strongest in their views as to the future of coal values and who had given due weight to the recent stiffening among producers. Earlier in the year the attempt to secure full Government prices was a half-hearted sort of affair, but in the past few weeks the leading operators have gone at the matter in a way that showed they really meant it; and for a fortnight past many operators have refused to contract for coal at the \$2.35 price for deliveries running longer than to Sept. 1. However weak and uncertain the Pittsburgh district coal situation has seemed to be since the signing of the armistice, one fact stands out prominently, that for several weeks past it has been growing stronger.

The whole Pittsburgh district is feeling elated over the situation as now presented, but it has some interesting questions to answer. For instance, how gracefully can the operators continue their contention that the railroads and the general public should pay precisely the same price, when the Pennsylvania R. R. has accepted the \$2.35 price? Also the contention of Pittsburgh operators that they were not given as fair a price, under Government control, as certain other districts, should perhaps make them view with equanimity the acceptance of lower than Government prices by other districts.

Production in the district continues at about 50 per cent. of capacity, stocks still being in evidence, while consumption, at least by the steel industry, continues to decrease and lake shipments do not amount to much in point of tonnage. There continues to be business, of small total tonnage, placed at various special cut prices, this not affecting the attitude of large producers or having any influence upon contract prices, which are well maintained, and with some operators refusing contracts for the full period to Apr. 1 next. We repeat last week's market quotations. Byproduct coal, largely nominal, mine-run, \$2.35; high-grade gas coal, slack, \$2.10 @ 2.20; mine-run, \$2.35; 4-in., \$2.50 @ 2.60; 14-in., \$2.60 @ 2.70; steam, slack, \$1.90 @ 2; mine-run, \$2 @ 2.35; all net ton at mine, Pittsburgh district.

##### BUFFALO

**Bituminous still slow. Anthracite moving fast. Some sizes scarce.**

**Bituminous**—The market is still weak. Slack did not rally after it dropped off on the opening of the lake trade. Other grades hold pretty well, but it is only by efforts on the part of mine owners that any sort of profitable prices are maintained. This is partly because business is starting at a slow rate and partly because consumers refuse to accept the advice of the shippers and stock up against a sudden advance. It is the idea of the jobbers that consumption is still in excess of buying.

The Buffalo bituminous trade is so dependent on the Canadian movement that it is now especially slow, for Canada is not industrially as active as we are. Besides, the practice of shipping coal into Canada when it cannot be sold here always spoils that market when there is a surplus. The best to be said of the market is that the operators have held up production in a wonderful way against the small demand, thus showing that there is no excess profit to trade on.

Bituminous prices remain as before, with Allegheny Valley weaker than Pittsburgh, at \$4.65 for Allegheny Valley sizes, \$4.45 for Pittsburgh and No. 8 lump, \$4.20 for

same mine-run, and \$3.80 for all slack, per net ton, f.o.b. Buffalo.

**Anthracite**—The demand has been heavy of late, on account of the advance in price this month. Some days the supply has given out, much as it used to during the shortage period. Some of the lake shippers have been unable to get any for loading vessels, but they are not anxious, for the upper-lake ports are not ordering any as yet. This is shown by the slackness of lake freights. They opened at 42½c. to the head of Lake Superior and 50c. to Milwaukee and South Chicago, but shippers have cut the rates so that a new adjustment is likely to take place soon.

Lake shipments for the week were 119,200 net tons, of which 32,800 tons cleared for Chicago, 29,700 tons for Duluth-Superior, 22,800 tons for Milwaukee, 10,500 tons for Marquette, 9500 tons for Sheboygan, 7500 tons for Fort William and 6400 tons for Hancock.

The general advance of anthracite has put up local prices 10c. a ton horizontally as follows:

	F.o.b. Cars Gross Ton	At Curb Net Ton
Grate.....	\$8.65	\$10.35
Egg.....	8.55	10.30
Stove.....	8.80	10.20
Chestnut.....	8.90	10.60
Pea.....	7.10	9.15
Buckwheat.....	5.80	7.85

With 25c. additional for loading to lake vessels.

##### CLEVELAND

Prices in the Cleveland coal market are rather spotty, with a leaning toward strength. Slack probably should be accepted, for No. 8 operators are virtually buried under surpluses. A great deal of business is being repressed because of uncertainty at Washington on the Peck-Hines controversy, and this is expected to come out once a decision is reached.

**Bituminous**—Operators believe considerable business that has been held back for weeks and months will be placed shortly, many steam-coal users having stated they would come into the market about May 15. The price disagreement at Washington will be settled soon, is the general belief, and a settlement will be followed by a marked stiffening in demand. Iron and steel and allied plants—the largest single class consumer of coal in northern Ohio—now are operating at from 30 to 40 per cent. of normal. The United States Steel Corporation is reported holding up shipments. But stabilization of prices will directly affect steam coal favorably, operators say, and the industry will buy again.

Meanwhile, slack coal is piling up at the mines in southern and eastern Ohio and the quotations have weakened accordingly. As low as \$1.45 is reported for No. 8 slack by Cleveland consumers. On No. 6 slack, \$1.60 is the lowest said to have been offered. For lake shipment, \$1.60 has been quoted on No. 8 slack. No. 8½-in. lump for the head of the lakes seems to have settled at \$2.35 to \$2.45, compared with \$2.80 last season. Massillon lump prices have been advanced 15c., making the net ton delivered in Cleveland price \$7.15 to \$7.25. Pocahontas prices have remained unchanged, as have these of anthracite, but the tendency all the time is upward. Considerable domestic Pocahontas and anthracite is being taken.

Some mines in the No. 8 district are reported operating close to 100 per cent. while others, whose output is not going so largely to the lakes, are as low as one day a week. The railroads now are taking less fuel, reflecting poor business. Car supply everywhere is ample. Operators are unanimous in declaring bituminous coal will be scarcer and higher as the year wears on, and are campaigning actively to make sales, especially in the domestic trade.

**Lake Trade**—Chartering at Lake Erie ports is quite active, with the car dumpers handling all the way from 1600 to 1900 cars a day, probably averaging about 450,000 tons a week for the present. Both tonnage and cargoes are plentiful, and the feeling that it will be wise to crowd up as much coal as possible early in the season still persists.

Prices of coal per net ton delivered in Cleveland are:

Anthracite:	
Egg.....	\$10.85 to 10.95
Chestnut.....	11.15 to 11.25
Grate.....	10.95
Stove.....	11.05 to 11.15
Pocahontas:	
Forked.....	8.50 to 8.75
Lump.....	7.78 to 8.01
Mine-run.....	7.20

Domestic bituminous:			
West Virginia splint.....	7.05 to	7.15	
No. 8 Pittsburgh.....	6.10 to	6.35	
Massillon lump.....	7.15 to	7.25	
Steam coal:			
No. 6 slack.....	4.30 to	4.40	
No. 8 slack.....	4.70 to	4.85	
Youghiogheny.....	4.90 to	5.10	
No. 8 1/4-in. lump.....	5.35 to	5.50	
No. 6 mine-run.....	4.40 to	4.50	
No. 8 mine-run.....	4.70 to	4.85	

**DETROIT**

**Buying demand continues light in the bituminous branch of the Detroit market. Prices are somewhat unsettled.**

**Bituminous**—Only a small volume of business is being handled in the bituminous section of the Detroit market, according to jobbers, who also report that prices denote a rather unsettled condition. Consumers of steam coal are not buying freely, and their orders are described as few and scattering, covering only small tonnages. Many of the larger consumers are still deterred from action by the abnormal size of reserves. There seems a disposition on the part of a considerable number to remain out of the market until the present reserves have been largely cleared away, the purpose being to get rid of as much as possible of the stock purchased last season, in which is much coal of low grade and unsatisfactory power.

Efforts to stimulate business by shading prices are imputed to some of the dealers who have been credited with being the most earnest advocates of maintaining price stability. Sales have not been increased materially by the lower prices, some of the jobbers say. Large consumers, they explain, would prefer to pay the prices fixed by the Fuel Administration, if by doing so they could feel assured that competitors would not be accorded a price reduction that would constitute an advantage.

On a long-ton basis, quotations at the mine are reported as being approximately \$2.50 a ton on Hocking lump with West Virginia gas and splint lump 15c. higher and Pocahontas about \$2.75. Mine-run from the Hocking and other leading Ohio districts is offered at \$2, and from West Virginia at \$2.25. Ohio slack ranges around \$1.50, with the West Virginia product about 50c. higher. West Virginia splint and gas three-quarter-inch lump is quoted at \$2.50.

**Anthracite**—Most of the leading retail dealers seem to be quite well supplied with anthracite. Though the movement has not been heavy, the unusual weather conditions have assisted in conserving the supply. Domestic consumers are being urged to buy next winter's fuel now.

**Lake Trade**—Despite the fact that there has apparently been only a moderately large movement of lake coal, preliminary reports indicate that shipments from Lake Erie ports to May 1, will exceed 1,000,000 tons, surpassing shipments of 860,797 tons in the similar period of 1918.

**COLUMBUS**

A slight improvement in the steam trade is reported in Ohio territory. Reserve stocks are being used up and some of the larger consumers are now in the market. Uncertainty as to price is still holding up contracting to a large degree.

The steam trade is showing slightly more activity than has been exhibited during the past few weeks. Buying on the part of certain manufacturing concerns is more active as reserve stocks have been used up in some instances. Contracting, however, is still held up because of uncertainty as to prices, and little is expected until the price question is settled.

Railroad business is still up in the air, so to speak. While some short-time agreements have been made, still the larger contracts are being held in abeyance until prices are adjusted. Large steam users are also waiting on the railroad fuel market. Reserve stocks are still rather large, and consequently purchasers are biding their time. Rubber factories have large reserve stocks, and the same is true of many iron and steel plants. There is considerable steam tonnage being bought off the open market at reduced figures, but prices are not demoralized to any great extent.

The domestic trade is quiet, as little demand is reported except for the fancy grades. Pocahontas and West Virginia splints are moving well, and prices are generally above the last Government levels. Retail stocks are fairly good and most of the dealers are loath to increase them. Retail prices are fairly well maintained, and the larger dealers especially are holding firmly. The lake trade is slowly open-

ing. May 1 was the date set for the official opening of navigation, and some vessels were loaded at that date ready for movement to the Northwest. But dockmen are slow in making contracts because of price uncertainty. The lake trade is not expected to be under full sway before June 1. A large tonnage is being carried over on the upper lake docks.

**CINCINNATI**

**Steady improvement evident in coal market conditions.**

Generally speaking, the coal situation in Cincinnati has shown a steady improvement, and the business transacted during the past week augurs well for the immediate future. The large coal dealers have expressed themselves as being satisfied with the existing conditions, and the continued flow of inquiries is taken as a sign that the consumer is no longer waiting for prices to drop, but is contemplating the placing of orders. The large industrial firms have shown a willingness to make contracts for steam grades, which is in itself a good omen as this kind of buying has been quiet here recently. The demand for domestic grades is comparatively steady. Prices are remaining firm with no immediate prospects of serious fluctuation.

**LOUISVILLE**

**Markets stronger, with good demand. Many producers raising prices on domestic, and feeling that they have sold too much coal at less than it is worth.**

There has been a strong demand for better grades of domestic coal during the past few days, and many of the operators of eastern Kentucky who were quoting prices of \$2.85 are now quoting a minimum of \$3. Prices given out to jobbers and retailers a few weeks ago, and for April, May and June delivery, were based on regular monthly shipments of at least ten cars. Buyers in many instances were uncertain over this point, and figured that prices were set for the three months.

The demand for mine-run and general lines of steam coal has been better. Railroads have been buying freely, but have been unable to secure much good engine coal on contract at much less than \$2.35 per ton for eastern Kentucky. Industrial consumption is picking up as even large stockers are running low. Byproducts plants are not buying much, as they loaded up strongly some months ago, are still fairly well stocked and not operating at capacity. The demand for the steel and iron industries is not strong.

Retailers are buying a fair volume of coal for stocking purposes, and report a slight improvement in local demand. However, not much stocking is expected on the part of the domestic consumer until late in May.

Egg sizes are back to prewar differentials of about 25 per cent. under block coal, and that is where the grade should be according to many operators, who never figured that egg should sell for block prices. General quotations, short tons, are as follows:

	Eastern Kentucky	Western Kentucky
Block.....	\$3.00@\$3.25	\$2.60
Egg.....	2.60@ 2.85	2.60
Run-of-mine.....	2.40	2.35
Nut and slack.....	2.00	2.05

The fact that the better grades of eastern Kentucky and West Virginia, as well as smokeless coal, can be secured this year during the early spring and summer is expected to encourage buying on the part of better grade consumers who held off last year in hopes of eventually being able to secure high grades.

Enough river coal is arriving to take care of the river handlers, there being only three or four companies along the river who are making any effort to handle barge coal. These concerns are now securing very fair shipments.

**BIRMINGHAM**

**Market conditions without change, steam trade being dull. Domestic demand keeps pace with the output. Commercial production on about the same basis as past few weeks. Mines of furnace companies either closed down entirely or operated on about 50 per cent. schedule.**

As far as sales are concerned, there is no improvement in the local market over a week ago, though basic conditions of the trade are considered as stable and more promising. Consumers are rapidly using up their reserve supply and will be obliged to buy coal in the near future to supply the needs of industry. The output of steam coal is being absorbed daily and there is no accumulation, while prices are being

maintained firmly on Government schedule in effect Jan. 31.

Domestic coal is moving as fast as it is mined, and there is demand for more than is to be had at this time. Yards are stocking slowly, not being able to secure the tonnage that they desire on account of the restricted amount of domestic coal coming from the steam-domestic operations.

Collieries throughout the district, outside of domestic mines and those employing convict labor, are running on about half time. Some of the largest mines of the furnace companies have been closed down and will remain idle pending improvement in the iron market.

**Coke****CONNELLSVILLE**

**Spot furnace coke market stiffer. Adjustment values approximately unchanged. Production continues to decline.**

The spot furnace coke market is distinctly stiffer. As to the general market, this is of little direct consequence, for the spot market has been a narrow affair for weeks, represented by small tonnage that a few operators had to dispose of, while there was scarcely any demand from furnaces as the furnaces were well supplied by contract deliveries. The operators have been endeavoring to adjust production precisely to requirements so that there would not be any spot coke to offer, but furnaces have been blowing out at such a pace, and so suddenly, that this has been difficult. Now the operators seem to be catching up. Their production has certainly decreased at a rapid rate. One week ago and two weeks ago there was spot furnace coke to be had at \$3.60, and it was thought \$3.50 might possibly be done, while the best grade would bring only \$3.75. In the past few days the cheapest coke available has been \$3.65, and \$3.75 has been paid in several instances.

Adjustments for May shipments on contract are not favorably affected by the stiffening in the spot market, except that they reduce the ammunition of furnaces seeking a lower price than was arranged for April deliveries. One operator refused to go below \$4, as desired by the furnace, and the contract has been canceled. Adjustments have probably been made, or will be made, at \$4, with perhaps an occasional adjustment at a slightly higher figure.

Foundry coke is in about the same position as formerly, there being a fair demand, but in tonnages much smaller than the foundries involved usually take. The market may be quoted at \$3.65@\$3.75 for spot furnace, \$4@4.25 on contract adjustments for furnace and \$4.25@6 for foundry, depending on brand, per net ton at ovens.

The "Courier" reports production in the Connellsburg and Lower Connellsburg region in the week ended Apr. 26 at 135,360 tons, a decrease of 13,465 tons.

**Buffalo**—The demand continues light, with prices not always uniform. Quotations run from \$7.25 to \$7.60 for 72-hour foundry, \$6.60 to \$7 for 48-hour furnace, and \$6 to \$6.10 for off grades. Breeze and other reject coke are still unsalable. The lake movement of iron ore sets in slowly. As a rule the furnaces are not receiving any, for the regular sales have not been made yet. A little has come in on carrying contracts that held over from last season. The lake fleet depends in the main on grain for down cargoes, hoping for ore on the next trip.

**Middle Western****GENERAL REVIEW**

**Coal market on the mend, and mining conditions showing great improvement. Railroad situation still affects Middle West.**

The coal situation throughout the Middle West continues to show a slight improvement over last week. While this improvement is small, as usual, it is encouraging to note that within the last six weeks the market has been on the mend, rather than on the decline.

Reports from the Franklin and Harrisburg districts of Illinois are especially gratifying, both from the standpoint of improvement on current shipments and on contract. The buying public is showing an increased tendency to cover their coal requirements by contract, although unfortunately some of these contracts do not call for shipment until later in the season. No matter which way you look at it, however, a contract means that a certain

amount of coal is taken from the market for the year, and if the number of contracts is large enough, their influence is bound to be felt sooner or later.

Roughly speaking, the mines in Southern Illinois showed a decided improvement. Next came the mines in the Central district, which just about held their own. The scattered coal-producing properties throughout the rest of the state showed a little decrease in the tonnage produced and sold, but this is only natural, considering the dull times we are now experiencing. The situation in Indiana is not quite so good as that in Illinois. Even the mines in the Indiana Fourth Vein district slipped back a little rather than improved. This decrease in tonnage in the Indiana fields is so small that it is practically negligible.

The railroad situation continues dull in the extreme. The only reports available show that some of the roads bought little coal from mines in the Springfield district. No railroad coal was sold in Indiana last week. While the mines in the Middle West are idle, the gentlemen in charge of the purchase of coal for the railroads down at Washington continue to dilly-dally and delay matters to an extent which is proving decidedly disadvantageous to the coal industry in the Middle West. There is no denying the fact that there would be a tremendous improvement, both in the coal market and in operating conditions, if the proper authorities at Washington would make up their minds to tackle the railroad fuel question in the right way and settle it at an early date. In the meantime, labor is growing restive under the delays, and some operators report losing a large number of their men to other industries.

The bulletin of the National Coal Association reports that there was an increase for the week of 1468 cars for the producing fields of Indiana and Illinois. Inasmuch as the number of cars produced the week before last was 6668, this increase of practically 1500 cars is especially gratifying. The operators appear to be confirmed optimists, and they are looking forward to a time, within the next four to six weeks, when conditions will be much better than they are now.

#### CHICAGO

**Steam market improves while domestic situation is unchanged. Pocahontas coal brings high prices.**

The Chicago steam market has improved a little, as several sizable sales on the current market have been reported. Furthermore, the tendency throughout the country to contract for coal has been felt in Chicago, and a number of contracts closed have been for Chicago plants. Coal piles are getting pretty low, and this is bringing a large number of purchasing agents back into the market once more.

The domestic situation for the city continues unchanged, with a big demand for high-grade Eastern coal, and but little demand for coals produced in this territory. It is reported that Pocahontas and New River lump or egg have been sold as high as \$4.25 to \$4.50 per ton, f.o.b. mines. The reasons for this condition are: First—the retail dealers of Chicago feel that if they do not buy their Pocahontas coal now, they won't be able to buy it later on, on account of the export plans of the Administration. Second—the public have not taken at all kindly to the increased prices on anthracite, and therefore there is a very strong demand for high-grade substitutes, such as Pocahontas. Third—the West Virginia operators are having a hard time placing their steam sizes; in fact, their steam sizes have to be sacrificed. For this reason they are trying to break even by placing abnor-

mally high prices on their domestic sizes. Prices are as follows:

Southern Illinois	F.o.b. Mines,	Rate to
Franklin, Saline and Williamson Counties, Etc.	Per Ton	Chicago
Prepared sizes.....	\$2.55 to \$2.75	\$1.55
Mine-run.....	2.35 to 2.50	1.55
Screenings.....	1.85 to 2.20	1.55

Central Illinois—Springfield District	Prepared sizes.....	\$2.55 to \$2.75	\$1.32
	Mine-run.....	2.35	1.32
	Screenings.....	2.05	1.32

Northern Illinois	Prepared sizes.....	\$3.25	1.24
	Mine-run.....	3.00	1.24
	Screenings.....	2.75	1.24

#### INDIANA

Clinton Fourth Vein District	Prepared sizes.....	\$2.65 to \$2.75	1.27
	Mine-run.....	2.35 to 2.45	1.27
	Screenings.....	2.05 to 2.25	1.27

Knox County Field	Prepared sizes.....	2.65 to 2.75	1.37
	Mine-run.....	2.35 to 2.45	1.37
	Screenings.....	2.05 to 2.25	1.37

West Virginia Splint	Prepared sizes.....	2.50 to 2.75	2.60
	Mine-run.....	2.25 to 2.50	2.60

New River and Pocahontas	Prepared sizes.....	4.25 to 4.50	2.60
	Mine-run.....	2.75 to 3.25	2.60

Hazard and Harlan, Ky.	Prepared sizes.....	3.00 to 3.50	2.45
	Mine-run.....	2.55 to 2.75	2.45
	Nut, pea and slack.....	1.80 to 2.30	2.45
	Cannel lump.....	2.75 to 3.50	2.45
	Smithing coal.....	3.00 to 3.25	2.60

#### MILWAUKEE

**Promulgation of the spring price schedule stimulates the coal market. Coal cars going arriving daily by lake.**

The coal market, which has been quiet pending the promulgation of the spring schedule of prices, is now on a better basis, and a steady increase in business is looked for. The new schedule, which became effective May 1, cuts anthracite grades 20c. per ton, with the exception of buckwheat, which was reduced 85c. The reductions in eastern bituminous are much heavier. Illinois and Indiana coals remain unchanged. Dealers are urging consumers to stock up early at present prices, as coal and service are at bottom figures for the season. It is expected that prices will be stiffened on hard coal as the season advances. The custom in the past has been to add 10c. per ton to anthracite each month until September, in order to stimulate ordering.

Milwaukee got an early start on coal supplies by lake this year. Eighteen cargoes were received during the month of April, the aggregate receipts being 59,535 tons of anthracite and 92,652 tons of soft coal. Last year no coal cargoes were received in April. The first day of May brought three cargoes aggregating 7300 tons of anthracite and 9600 tons of soft coal.

Following are the retail prices of coal at Milwaukee which became effective on the first of May:

#### For Domestic Use

Anthracite—Chestnut, \$12.30; stove, \$12.20; egg, \$12; pea, \$10.80; buckwheat, \$9.75. Bituminous—West Virginia splint, screened, \$7.25; Hi-Heat, \$7.25; Hocking lump, egg and nut, \$7; Pittsburgh, screened, \$7; Pocahontas, mine-run, \$7.75; Pocahontas, egg and nut, \$9.75; Cheerful

Chunks (Kentucky for grates), \$7.75; Smithing, \$8.10.

Coke—Range, egg and nut, \$11; pea, \$9.75.

An extra charge of 50c. per ton if coal is carried in, and an extra charge of 25c. per ton on all deliveries in less than ton lots. No extra charge for carrying in coke, but an extra charge of 25c. per ton on orders of less than one ton.

#### Steam Coal

Youghiogheny—Screened, \$6.10; pile run, \$5.85; screenings, \$5.25. Pittsburgh—Screened, \$6; pile run, \$5.60; screenings, \$5.25. Hocking Lump—Screened, \$6; pile run, \$5.60; screenings, \$5. West Virginia Splint—Screened, \$6.25; pile run, \$5.85; screenings, \$5.25. Kentucky Lump—Screened, \$6.75; pile run, \$6.35; screenings, \$5.25. Pocahontas—Mine-run, \$5.75; screenings, \$5.50; Kanawha Gas—Mine-run, \$5.75; Smithing, \$7.10. Illinois and Indiana—Screened, \$6.50; pile run, \$6.25; screenings, \$6; smithing, \$7.68.

#### ST. LOUIS

An inactive market, with everything lagging. Some few contracts being let on local business at a price below cost of production.

The local situation is not encouraging, for the reason that local wagon-load delivery contracts in St. Louis are going far below cost of production. In spite of the efforts made by the United Mine Workers to keep their operators from selling coal below cost, the fact remains that it continues to a greater extent now than at any time since the Fuel Administration removed restrictions.

The market has shown a tendency to strengthen some on screenings, but on other sizes, if anything, there has been a breaking away from the prices that were maintained some time ago. There is a little railroad tonnage moving out of these fields, but it is so slight that it makes little impression on the field as a whole. The few contracts that are being made other than railroad are light and are not taking much tonnage at this time.

In the Mt. Olive and Staunton fields prices are pretty well maintained, and while work is not plentiful the mines for the most part are getting a couple of days a week. This coal continues to move north and west and in fairly good tonnage, everything considered.

In the Carterville field of Williamson and Franklin Counties there has been a let-up in the amount of business offered, with the result that working time continues to decrease, and practically every mine in the entire district now producing commercial coal is on short time. As in other fields, screenings are in good demand, as well as the smaller sizes of nut. The railroad tonnage from this field is somewhat light, but even at that it is heavy enough to make an impression in the tonnage of certain operations, as well as to keep a large number of miners satisfied as to time.

One of the things noticeable at the present time is the failure of business to come from the south as heretofore. This coal seems to have lost out in a large section of the south to which it formerly went at this season of the year in heavy volume. This is occasioned by the fact that the larger part of this territory has been neglected during the high price period in the past year or two, and also the inroads made by the West Kentucky and Alabama coal will be hard to overcome.

There is at the present time a light tonnage of Carterville and anthracite being put into storage, but it is not noticeable. It will, however, continue to grow from now on. The same may be said of coke, both byproduct and gas.

There is no smokeless coming in and no demand for it and the same applies to Arkansas.

#### Coal and Coke Securities

New York Stock Exchange Closing Quotations May 5, 1919

STOCKS	Ticker Abv.	Bid	Asked	BONDS	Bid	Asked
American Coal Co. of Allegheny.....	(ACL)	45	45	Cahaba Coal, 1st Gtd. 6s, 1922.....	90	90
Burns Brothers, Com.....	(BB)	154	157 $\frac{1}{2}$	Clearfield Bituminous Coal, 1st 4s, Ser. A, 1940.....	71	71
Burns Brothers, Pfd.....	(BB)	110	112	Colorado Fuel & Iron, Gen. 5s, 1943.....	91	91
Central Coal & Coke, Com.....	(CK)	55	55	Colorado Indus. 1st Mtg. & Col. Tr. 5s, 1934.....	74 $\frac{1}{2}$	75
Central Coal & Coke, Pfd.....	(CK)	63	63	Consolidation Coal of Maryland, 1st Ref. 5s, 1950.....	87	90
Colorado Fuel & Iron, Com.....	(CF)	44 $\frac{1}{2}$	44 $\frac{1}{2}$	Jefferson & Clearfield Coal & Iron, Sec. Mort. 5s, 1926.....	99 $\frac{1}{2}$	100
Colorado Fuel & Iron, Pfd.....	(CF)	105	125	Lehigh Valley Coal, 1st Gtd. 5s, 1933.....	79 $\frac{1}{2}$	79 $\frac{1}{2}$
Consolidation Coal of Maryland.....	(CGM)	75	75	Lehigh Valley Coal, Gtd. Int. Red. to 4%, 1933.....	90	90
Elk Horn Coal, Com.....	(EH)	28 $\frac{1}{2}$	29	Pleasant Valley Coal, 1st S. F. 5s, 1928.....	80 $\frac{1}{2}$	80 $\frac{1}{2}$
Elk Horn Coal, Pfd.....	(EH)	47	47	Pocahontas Coal & Coke, Joint 4s, 1941.....	83 $\frac{1}{2}$	85
Island Creek Coal, Com.....	(ICR)	39	39	Pocahontas Con. Collieries, 1st S. F. 5s, 1957.....	88	88
Island Creek Coal, Pfd.....	(ICR)	75	75	Roch. & Pitts. Coal & Ir., Helvetia Pur. Money 5s, 1946.....	98	98
Jefferson & Clearfield Coal & Iron, Pfd.....	(JF)	60	60	St. L. Rocky Mnt. & Pac. Stamped 5s, 1955.....	80	83
New Central Coal of West Va.....	(NCC)	5	5	Tenn. Coal, Iron & R.R. Gen. 5s, 1951.....	91	95 $\frac{1}{2}$
Pittsburgh Coal, Com.....	(PC)	52 $\frac{1}{2}$	52 $\frac{1}{2}$	Utah Fuel, 1st Sinking Fund 5s, 1931.....	87	87
Pittsburgh Coal, Pfd.....	(PC)	87	88	Victor Fuel, 1st Mtg. Sinking Fund 5s, 1953.....	55	70
Pond Creek Coal.....	(PD)	17 $\frac{1}{2}$	18 $\frac{1}{2}$	Virginia Iron, Coal & Coke 1st 5s, 1949.....	88	85 $\frac{1}{2}$
Virginia Iron, Coal & Coke.....	(VK)	57 $\frac{1}{2}$	59			

\* Ex. Div.

# CURRENT PRICES—MATERIALS & SUPPLIES

## IRON AND STEEL

**PIG IRON**—Quotations compiled by The Matthew Addy Company as per Department of Commerce Committee Schedule.

	Current	One Month Ago
CINCINNATI		
No. 2 Southern	\$30.75	\$30.35
Northern Basic	27.55	27.55
Southern Ohio No. 2	28.55	28.55
NEW YORK, Tidewater delivery		
Penna. 2X	31.90	...
Virginia No. 2	31.15	32.40
Southern No. 2	33.95	34.70
BIRMINGHAM		
No. 2 Foundry	26.75	25.75
PHILADELPHIA		
Eastern Pa. No. 2	30.65	31.90
Virginia No. 2	30.85	33.25
Basic	30.90	29.65
Grey Forge	30.90	29.65
Bessemer	31.85	...
CHICAGO		
No. 2 Foundry Local	27.25	26.75
No. 2 Foundry Southern	31.75	33.00
PITTSBURGH, including freight charge from the Valley		
No. 2 Foundry	28.15	26.25
Basic	27.15	25.75
Bessemer	29.35	29.35

\* F.o.b. furnace. † Delivered.

**STRUCTURAL MATERIAL**—The following are the base prices, f.o.b. mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

Mill	New York			St. Louis	Chicago
	Pittsburgh	Current	One Year Ago		
Beams, 3 to 15 in.	\$2.45	\$3.47	\$4.19	\$3.39	\$3.47
Channels, 3 to 15 in.	2.45	3.47	4.19	3.39	3.47
Angles, 3 to 6 in., 4 in. thick.	2.45	3.47	4.19	3.39	3.47
Tees, 3 in. and larger	2.45	3.52	4.19	3.39	3.47
Plates	2.66	3.67	4.44	3.39	3.67

**BAR IRON**—Prices in cents per pound at cities named are as follows:

Pittsburgh	St. Louis	Denver	Birmingham
2.75	3.44	3.80	3.50

**NAILS**—Prices per keg from warehouse in cities named:

Mill	St. Louis	Denver	Chicago	Birmingham	San Francisco	Dallas	
Wire....	\$3.25	\$4.00	\$5.11	\$4.37	\$4.50	\$5.00	\$4.75
Cut.....	3.45	6.50	5.61	6.50	...	6.75	...

**TRACK SUPPLIES**—The following prices are base per 100 lb. f.o.b. Pittsburgh for carload lots, together with the warehouse prices at the places named:

Pittsburgh	Cincinnati	Chicago	St. Louis	San Francisco	Birmingham	Denver	
Standard railroad spikes $\frac{1}{2}$ in. and larger	\$3.25	\$6.00	\$4.27	\$5.04	\$6.15	\$5.25	\$5.55
Track bolts	4.90	8.90	5.17	Prem.	7.20	8.00	6.55
Standard section angle bars	3.00	...	4.22	Prem.	4.60	...	4.95

**COLD DRAWN STEEL SHAFTING**—From warehouse to consumers requiring fair-sized lots, the following discounts hold:

Cincinnati	Cleveland	Chicago	St. Louis	Denver	Birmingham
17½%	List —5%	List —2%	+15%	+30%	+20%

**HORSE AND MULE SHOES**—Warehouse prices per 100 lb. in cities named:

Mill	Cin-	Pittsburgh	cinnati	Chicago	St. Louis	Denver	Birm-
	Chi-						ingham
Straight.....	\$5.75	\$7.50	\$6.50	\$7.25	\$8.50	\$7.35	
Assorted.....	6.40	7.50	6.50-7.00	6.40	8.75	7.60	

Cincinnati—Horseshoe nails sell for \$4.50 to \$5 per 25-lb. box.

**CAST-IRON PIPE**—The following are prices per net ton for carload lots:

New York		Chicago		St. Louis		San Francisco		Dallas	
One Month	One Year Ago	Current	Year Ago	Current	Year Ago	Current	Year Ago	Current	Year Ago
4 in.....	\$60.70	\$65.70	\$58.35	\$59.80	\$53.00	\$77.55	\$65.00		
6 in. and over	57.70	62.70	55.35	56.80	50.00	74.55	62.00		

Gas pipe and 16-ft. lengths are \$1 per ton extra.

**STEEL RAILS**—The following quotations are per ton f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5¢ per 100 lb. is charged extra:

Pittsburgh		Chicago		
Current	Year Ago	Current	Year Ago	
Standard Bessemer rails..	\$45.00	\$55.00	\$45.00	\$65.00
Standard openhearth rails	47.00	57.00	47.00	67.00
Light rails, 8 to 10 lb....	2.58*	3.13*	2.83*	3.13*
Light rails, 12 to 14 lb....	2.54*	3.09*	2.79*	3.09*
Light rails, 25 to 45 lb....	2.45*	3.00*	2.70*	3.00*

\* Per 100 lb.

**OLD MATERIAL**—The prices following are per gross ton paid to dealers and producers in New York. In Chicago and St. Louis the quotations are per net ton and cover delivery at the buyer's works, including freight transfer charges:

New York	Chicago	St. Louis	
No. 1 railroad wrought.....	\$18.50	\$16.50	\$15.50
Stove plate.....	16.00	16.50	15.50
No. 1 machinery cast.....	22.00	22.00	19.50
Machine shop turnings.....	8.00	6.75	7.00
Cast borings.....	9.50	9.75	7.50
Railroad malleable cast.....	13.50	16.50	14.00

**COAL BIT STEEL**—Warehouse price per pound is as follows:

New York	Cincinnati	Birmingham	St. Louis	Denver
\$0.12	\$0.16	\$0.18	\$0.13	\$0.18

**DRILL STEEL**—Warehouse price per pound:

New York	St. Louis	Birmingham
16c.	13c.	15c.

**PIPE**—The following discounts are for carload lots f.o.b. Pittsburgh; basing card of Jan. 1, 1919 for steel pipe and for iron pipe:

BUTT WELD		LAP WELD			
Inches	Steel Black	Galvanized	Inches	Iron Black	Galvanized
$\frac{1}{4}$ to $\frac{1}{2}$	50%	24%	$\frac{3}{4}$ to 1 $\frac{1}{2}$	39%	23%
1 $\frac{1}{2}$	54%	40%			
2	57%	44%			

BUTT WELD, EXTRA STRONG PLAIN ENDS		LAP WELD, EXTRA STRONG PLAIN ENDS			
Inches	Steel Black	Galvanized	Inches	Steel Black	Galvanized
$\frac{1}{4}$ to $\frac{1}{2}$	46%	29%	$\frac{3}{4}$ to 1 $\frac{1}{2}$	39%	24%
1 $\frac{1}{2}$	51%	39%			
2	55%	43%			

STOCKS DISCOUNTS IN CITIES NAMED ARE AS FOLLOWS:		WIRE ROPE—DISCOUNTS FROM LIST PRICE ON REGULAR GRADES OF BRIGHT AND GALVANIZED ARE AS FOLLOWS:	
New York	Cleveland	New York	Cleveland
Galvanized iron rigging.....		+12%	
Galvanized cast steel rigging.....		+7%	
Bright plain rigging.....		35%	
Bright cast steel.....		22%	
Bright iron and iron tiller.....		5%	

**STEEL SHEETS**—The following are the prices in cents per pound from jobbers' warehouse at the cities named:

New York		Cleveland		Chicago	
Pittsburgh,	Mill Carloads	Current	Month Ago	Current	Month Ago
No. 28 black.....	4.35	5.62	6.22	6.45	5.27
No. 26 black.....	4.25	5.52	6.12	6.35	5.27
Nos. 22 and 24 black.....	4.20	5.47	6.07	6.30	5.12
Nos. 18 and 20 black.....	4.15	5.42	6.02	6.25	5.07
No. 16 blue annealed.....	3.75	4.77	5.37	5.65	4.67
No. 14 blue annealed.....	3.65	4.67	5.27	5.55	4.57
No. 10 blue annealed.....	3.55	4.57	5.17	5.45	4.47
No. 18 galvanized.....	5.70	7.42	7.57	7.70	6.62
No. 26 galvanized.....	5.40	7.12	7.27	7.40	6.32
No. 24 galvanized.....	5.25	6.97	7.12	7.25	6.17

\* For painted corrugated sheets add 30c. per 100 lb. for 25 to 28 gage; 25c. for 19 to 24 gages; for galvanized corrugated sheets add 15c., all gages.

## SHOP SUPPLIES

Semi-finished nuts sell at the following discounts from list price:

	Current	One	Year Ago
New York	50-10%	40%	
Chicago	50%	50%	
Cleveland	60-10-10%	60%	

MACHINE BOLTS—Warehouse discounts in the following cities:

	New York	Cleveland	Chicago
1 by 4 in. and smaller	40%	50%	50%
Larger and longer up to 1 in. by 30 in.	50%	40%	40%

WASHERS—From warehouses at the places named the following amount is deducted from list price:

	New York	Cleveland	Chicago
For wrought-iron washers:	\$2.00	\$3.00	\$2.25
For cast-iron washers the base price per 100 lb. is as follows:	\$5.00	\$3.75	\$4.00

RIVETS—The following quotations are allowed for fair sized orders from warehouse:

	New York	Cleveland	Chicago
Steel $\frac{1}{4}$ and smaller	4-10-5%	60-5%	45%
Tinned	30%	60-5%	40%

Boiler,  $\frac{1}{4}$ , 1 in. diameter by 2 in. to 5 in. sell as follows per 100 lb.:

	New York	Cleveland	Chicago	Pittsburgh
5-lb. cans	\$6.25	\$4.85	\$4.82	\$4.65

Structural, same sizes:

	New York	Cleveland	Chicago	Pittsburgh
5-lb. cans	\$6.25	\$4.85	\$4.82	\$4.65

## CONSTRUCTION MATERIALS

LINSEED OIL—These prices are per gallon:

	New York	Cleveland	Chicago
Current	One	Current	One
Year Ago		Year Ago	Year Ago
Raw in barrel	\$1.63	\$1.55	\$1.71
5-gal. cans	1.76	1.65	1.81

WHITE AND RED LEAD—Base price:

	Red	White	
Current	1 Year Ago	Current	1 Year Ago
Dry	Dry	Dry	Dry
In Oil	In Oil	In Oil	In Oil
100-lb. keg	13.00	14.50	12.25
25 and 50-lb. kegs	13.25	14.75	12.50
12½-lb. keg	13.50	15.00	12.75
5-lb. cans	15.00	16.50	14.25
1-lb. cans	16.00	17.50	14.25

500 lb. lots less 10% discount. 2000 lb. lots less 10-2½% discount.

COMMON BRICK—The prices per 1000 in cargo or carload lots are as follows:

	Cincinnati	Birmingham	Denver
St. Louis, salmon	\$15 and 16	\$15.00	10.00

PREPARED ROOFINGS—Standard grade rubbered surface, complete with nails and cement, costs per square as follows in New York, St. Louis, Chicago and San Francisco.

	1-Ply	2-Ply	3-Ply
C.L.	I.e.l.	C.L.	I.e.l.
No. 1 grade	\$1.35	\$1.60	\$1.70
No. 2 grade	1.20	1.45	1.50

Asbestos asphalt saturated felt (14 lb. per square) costs \$5.00 per 100 lb.

Slate-surfaced roofing (red and green) in rolls of 108 sq.ft. costs \$1.80 per roll in carload lots and \$2.05 for smaller quantities.

Shingles, red and green slate finish cost \$5.00 per square in carloads, \$5.25 in smaller quantities, in Philadelphia.

ROOFING MATERIAL—Prices per ton f. o. b. New York and Chicago:

	Carload Lots	Carload Lots	Less Than
N. Y.	Chicago	N. Y.	Chicago
Tar felt (14 lb. per square of 100 sq.ft.)	\$50.00	\$50.00	\$51.00
Tar pitch (in 400-lb. bbl.)	19.00	16.00	20.00
Asphalt pitch (in barrels)	30.00	30.00	35.50
Asphalt felt	65.00	65.00	69.50

HOLLOW TILE—Price per block in carload lots for hollow building tile:

	4x12x12	8x12x12	12x12x12
St. Paul	\$0.056	\$0.11	\$0.162
Seattle	.09	.175	.30
Los Angeles*	.082	.154	.236
New Orleans	.12	.15	.20
Pittsburgh	.065	.115	.....

\*F. o. b. factory, 4, 8 and 10 inch.

LUMBER—Price of pine per M in carload lots:

	1-In. Rough	2-In. T. and G.	8 x 8 In. x 20 Ft.
10 In. x 16 Ft.	10 In. x 16 Ft.	10 In. x 16 Ft.	.....
St. Louis	\$38@41	\$38.00	\$40.00
Birmingham	39.00	35.00	31.00
Denver	45.00	38.00	44.00
Cincinnati	43.00	42.00	37.00

EXPLOSIVES—Price per pound of dynamite in small lots and price per 25-lb. keg for black powder:

	Low Freezing	Gelatin	Black Powder
20%	40%	60%	80%
New York	\$0.27 <sup>1</sup>	\$0.30	\$2.40
Boston	\$0.22 <sup>1</sup>	.24 <sup>1</sup>	.26 <sup>1</sup>
Cincinnati	.19 <sup>1</sup>	.21 <sup>1</sup>	.23 <sup>1</sup>
Kansas City	.19	.23 <sup>1</sup>	.26 <sup>1</sup>
New Orleans	.23 <sup>1</sup> (50%)	.22 <sup>1</sup>	.24 <sup>1</sup>
Seattle	.18 <sup>1</sup>	.21 <sup>1</sup>	.21
Chicago	.18 <sup>1</sup>	.21 <sup>1</sup>	.25 <sup>1</sup>
St. Paul	.19	.23 <sup>1</sup>	.26 <sup>1</sup>
St. Louis	.19	.23 <sup>1</sup>	.25 <sup>1</sup>
Denver	.17 <sup>1</sup>	.22 <sup>1</sup>	.24 <sup>1</sup>
Dallas	.18 <sup>1</sup>	.22 <sup>1</sup>	.26 <sup>1</sup>
Los Angeles	.19	.24	.27

2.75

## COAL AGE

### MISCELLANEOUS

GREASES—Prices are as follows in the following cities in cents per pound for barrel lots:

Circ'nat-i	St. Louis	Birming-ham	Den-ver
Cup	7	7.2	8 <sup>1</sup>
Fiber or sponge	8	13	8 <sup>1</sup>
Transmission	7	13	8 <sup>1</sup>
Axle	4 <sup>1</sup>	4 <sup>1</sup>	5 <sup>1</sup>
Gear	4 <sup>1</sup>	7 <sup>1</sup>	8
Car journal	22 (gal.)	4.9	8 <sup>1</sup>

BABBITT METAL—Warehouse prices in cents per pound:

New York	Cleveland	Chicago				
Current	One	Current	One	Current	One	
Year Ago	Year Ago	Year Ago	Year Ago	Year Ago	Year Ago	
Best grade	87.00	90.00	79.00	100.00	75.00	100.00
Commercial	42.00	50.00	18.50	22.00	15.00	22.00

HOSE—Following are prices of various classes of hose:

Fire	50-Ft. Lengths
Underwriters' 2½-in.	75c. per ft.
Common, 2½-in.	30c.

Air First Grade Second Grade Third Grade

1-in. per ft.	Steam—Discounts from list	First grade	Second grade	Third grade
25%	35%	35%	35%	40%

LEATHER BELTING—Present discounts from list in cities named:

Medium Grade	Heavy Grade
St. Louis	45%
Denver	35-50%
Birmingham	30%
Chicago	45%
Cincinnati	40-10%

RAWHIDE LACING—20% for cut; 45c. per sq.ft. for ordinary.

PACKING—Prices per pound:

Rubber and duck for low-pressure steam	\$0.9
Duck and rubber for piston packing	1.00
Flax, regular	1.20
Flax, wat. proofed	1.60
Compressed asbestos sheet	1.00
Wire insertion asbestos sheet	1.20
Rubber sheet	.60
Rubber sheet, wire insertion	.80
Rubber sheet, duck insertion	.50
Rubber sheet, cloth insertion	.30
Asbestos packing, twisted or braided, and graphited, for valve stems and stuffing boxes	.85

MANILA ROPE—For rope smaller than 1-in. the price is ½ to 2c. extra: while for quantities amounting to less than 600 ft. there is an extra charge of 1c. The number of feet per pound for the various sizes is as follows: 1-in., 8 ft.; 1½-in., 6; 1¾-in., 4½; 1-in., 3½; 1¼-in., 2 ft. 10 in.; 1½-in., 2 ft. 4 in. Following is price per pound for 1-in. and larger, in 1200-ft. coils:

Boston</th
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